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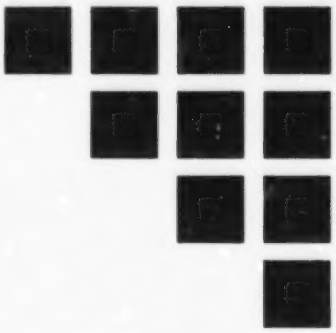


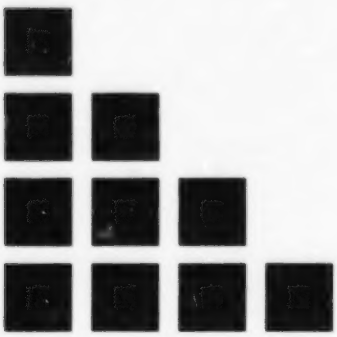
Earnings of Post-Secondary Graduates in Canada: Changes in the Structure of Earnings in the 1980s and 1990s

R-99-12E.b

by
Ross Finnie

July 1999

Research Paper



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Abstract

This paper looks at the labour market outcomes of three recent cohorts of post-secondary graduates in Canada using the National Graduates Surveys of the classes of 1982, 1986, and 1990. Unemployment rates compare very favourably with those of non-graduates, decline considerably from two years to five years following graduation, and show no general deterioration across cohorts. Earnings levels show small to moderate declines across cohorts in the case of male graduates, and increases of similar magnitudes for female graduates. The factors underlying the cross-cohort earnings patterns are investigated using a standard regression-based decomposition approach, and it is found that there was no general (negative) shift in the market conditions faced by post-secondary graduates in Canada from the early 1980s into the mid-1990s.

This paper is part of a set of two research studies titled:

Earnings of Post-Secondary Graduates in Canada:

- *Changes in the Structure of Earnings in the 1980s and 1990s*
- *Holding Their Own–Trends in Earnings Levels and Employment Rates*

Résumé

Ce document présente les résultats sur le marché du travail de trois récentes cohortes de diplômés de niveau postsecondaire au Canada à partir des *Enquêtes nationales auprès des diplômés* des promotions de 1982, 1986 et 1990. Le taux de chômage comparativement à celui des non diplômés baisse considérablement à partir de deux à cinq ans après l'obtention du diplôme, et ne démontre aucune évolution défavorable d'une cohorte à l'autre. Les niveaux de rémunération montrent des baisses allant de faibles à modérées d'une cohorte à l'autre pour les hommes, et des augmentations d'importance similaire pour les femmes. Les facteurs qui sous-tendent les tendances de la rémunération d'une cohorte à l'autre sont étudiés à l'aide d'une décomposition classique des différences. Les résultâts démontrent que les conditions du marché du travail auxquelles les diplômés de niveau postsecondaire au Canada ont été confrontées du début des années 80 jusqu'au milieu des année 90 n'ont pas changées de façon importante (négative).

Ce document fait partie d'une série de deux études de recherche intitulées :

Earnings of Post-Secondary Graduates in Canada:

- *Changes in the Structure of Earnings in the 1980s and 1990s*
- *Holding Their Own - Trends in Earnings Levels and Employment Rates*

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1. Introduction

How have recent post-secondary graduates been faring in the labour market of late? This is an important question for a number of reasons. First, there is the straightforward issue of economic well-being, with employment rates and earnings levels obviously translating directly into standards of living for this group of workers, with any shifts in outcomes which appear to be of a longer-run nature being especially important in this regard. Any such changes could, furthermore, have significant implications for various social programs, since future revenues and expenditures will depend on the fortunes of today's younger workers. Third, the performance of post-secondary graduates is relevant to a variety of education-related issues, including the rates of returns to the underlying investments (for both individuals and society in general), the associated incentives for pursuing post-secondary studies, the share of education costs and the related debt loads which students might be expected to bear, the need for curriculum reform, and more. Finally, graduates' outcomes are a useful barometer of the nation's labour market performance, with those at the cutting edge of the "new knowledge economy" presumably being worth particularly close scrutiny in this regard.

The general impression – on the street and in the existing literature – is that recent cohorts of post-secondary graduates have in fact been doing worse than previous ones. Numerous studies have reported declines in the employment rates and earnings levels of younger Canadian workers generally, accompanied by explanations of how this has come to be, and some of these have at least tried to separate out the fortunes of post-secondary graduates from other younger workers in some manner and have found similar, if not quite as serious, declines for those with higher levels of education.[1]

[1] Beaudry and Green [1997], Beach and Slotsve [1996], Finnie [1997a], Morissette and Bérubé [1996], Morissette, Myles, and Picot [1995], Picot [1997], Riddell [1995], and Zyblock [1996] all report that the earnings levels of younger workers have been declining in relative and/or absolute terms; while Beaudry and Green, Morissette and Bérubé, and a series of papers by Finnie and various co-authors (Finnie [1997b, c, d], Finnie and Beach [1998], Finnie and Gray [1998]) indicate that younger workers' movements up the earnings ladder over the early years in the labour market have also slowed. In short, the age-earnings profiles of recent cohorts of younger workers appear to have both shifted downward and become flatter, thus indicating a decline in "lifetime" earnings. See OECD [1996] for an international perspective of the earnings of younger workers.

These studies have, however, mostly been restricted to the Survey of Consumer Finances databases.[2] One problem with this concentration of the empirical evidence is that there has perhaps been less cross-verification of the patterns than would be desirable – although the consistency of the SCF results with those studies which are based on other data sources is obviously significant in this regard. Second, and perhaps more significantly, because it is a general purpose labour market survey, the potential for doing extended analysis at the sub-group level with the SCF – such as recent post-secondary graduates – is limited due to the resulting small sample sizes and lack of specific variables relating to the school-to-work transition. Third, the cross-sectional nature of the SCF data precludes any sort of explicitly dynamic analysis, such as how employment status or earnings levels evolve over the early years in the labour market for given individuals.[3] Finally, the SCF data pose problems for comparisons over time based on the precise level of education due to changes in the definition of the educational categories used in the survey in 1989.[4]

The contribution of this paper is, then, to offer new empirical evidence regarding the fortunes of younger workers by reporting the results of a cross-cohort, longitudinal analysis of the early labour market outcomes of Canadian post-secondary (college and university) graduates based on three waves of the National Graduates Surveys databases. The NGS databases used here comprise large, representative samples of Canadian post-secondary students who successfully completed their college and university programs in 1982, 1986, and 1990, and include detailed information on individuals' educational experiences and early labour market outcomes based on interviews conducted two and five years after graduation for each group. The NGS data thus facilitate a tightly focused and detailed dynamic analysis of the school-to-work transition of Canadian post-secondary graduates from the early 1980s into the mid-1990s, a period generally thought to be one of significant change in labour market outcomes – especially for younger workers.

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[2] Finnie [1997a] and Morissette and Bérubé [1996] are based on tax files, but they do not break results down by education level, since this information is not given in the tax files upon which their work is based.

[3] Beaudry and Green [1997] attempt to push the capacity of the SCF data beyond its inherently static nature by constructing synthetic earnings profiles from the various cross-sections, but having true longitudinal data is invariably preferred to such constructions.

[4] Beaudry and Green [1997] also develop useful means for dealing with the 1989 changes in the education categories to create classifications that are as consistent as possible over time, but are still left with an irresolvable margin of error in this regard (due largely to non-conventional educational pathways).

After describing the data and sample construction, the paper first provides an overview of the trends in employment rates and mean earnings levels by sex and level of education – College, Bachelor's, Master's, and Ph.D. – as of two and five years after graduation for each of the three cohorts covered by the NGS data, thus providing a dynamic overview of the school-to-work transition along these dimensions over the period covered. The remainder of the paper then presents an analysis of the change in the patterns of graduates' earnings using the standard "decomposition" technique of estimating separate earnings regressions for each cohort and using these results to identify the effects of changes in individuals' characteristics and the effects of changes in the structure of earnings as represented by the relevant regression coefficients on mean earnings levels across cohorts.

The broad goal of the paper is, then, to exploit the NGS databases to provide fresh empirical analysis of what has been happening to recent Canadian post-secondary graduates in terms of their employment rates and average earnings levels and to document the various influences which have been affecting those earnings levels in order to expand our understanding of how graduates have been faring, to attempt to explain some of the factors underlying the observed patterns, and to draw out some of the implications of these findings.

2. The Data and the Model Specification

The first part of this section describes the general characteristics of the National Graduates Surveys and the selection of the working samples. In the second part, the decomposition method and underlying regression model are presented, including a listing of the variables included in the analysis.

2.1 The NGS Data and the Construction of the Working Samples

2.1.1 The National Graduates Surveys

The National Graduates Surveys (and follow-up) databases, developed by Statistics Canada in partnership with Human Resources Development Canada, are well suited to this analysis for a number of reasons. First, the NGS files are representative of the underlying national population of college and university graduates and have abundant numbers of observations (over 30,000 individuals in each survey), thereby facilitating the meaningful analysis of the post-graduation experience at a detailed level.[5]

Second, the availability of data for three separate cohorts of graduates – those who completed their studies in 1982, 1986, and 1990 – permits the comparison of outcomes over a period generally thought to be one characterised by important changes in labour market outcomes, especially for younger workers, while also bringing the record as up to date as possible.[6]

Third, the NGS files are longitudinal, based on information gathered during interviews carried out two and five years after graduation for each cohort (1984/87, 1988/91, and 1992/95), thus allowing for a dynamic and relatively extended analysis of the school-to-work transition precisely situated as of two specific points in time relative to graduation.

Finally, the databases include an interesting array of variables covering the educational experiences, general labour market outcomes, specific job characteristics, and basic demographic characteristics of graduates.

[5] A stratified sample scheme (by province, level of education, and field of study) is employed in the NGS databases. All results reported below reflect the appropriate sample weights. The databases also include trade and vocational school graduates, but these individuals are not included in the present analysis.

[6] The first survey of 1995 graduates has been carried out, but those data are not ready for analysis at the time of this writing and will obviously lack the second interview data until those are collected in the year 2000.

2.1.2 Construction of the Working Samples

Graduates who obtained an additional degree by one of the two interviews were deleted from the analysis at that point.[7] This was done on the grounds that such graduates no longer belonged to the original education group (*e.g.*, a Bachelor's graduate might have become a Master's graduate and perhaps changed major field of study) and had in any event been mixing school and work in a way likely to affect the labour market outcomes upon which this analysis is focused. Including later graduates would also throw off the precise post-graduation time frame corresponding to the two interview dates (*i.e.*, two and five years after graduation) which holds for the non-continuing group.

After calculating labour force activity rates, the samples were further restricted to full-time workers only, thus focusing the exercise on individuals with significant labour market attachment and abstracting from labour supply decisions which could affect earnings patterns. In particular, most continuing (full-time) students were eliminated by this condition, desirable for reasons similar to those given for the deletion of graduates who went on to obtain additional diplomas just discussed.[8] For those concerned that the resulting samples are overly restrictive, mean earnings patterns with part-time workers included are provided in Appendix C, and the associated decomposition results in Appendix D, but the results turn out to be generally similar to those for full-time workers alone.

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[7] That is, graduates who had obtained a new degree/certificate/diploma by the first interview were deleted from both periods' analysis, while those who obtained a new diploma only by the second interview were included in the analysis of the first period situation (as long as they met the other selection criteria) but not the second. This selection procedure resulted in samples which are as inclusive as possible for each survey year, which is especially important in a context where going on to further schooling could be related to early labour market outcomes, a hypothesis which finds support in the case of engineering graduates in Finnie and Lavoie [1997]. It is, furthermore, impossible to identify the specific field of study in which a new degree was obtained as of the 1984 survey for the 1982 graduates.

Essentially all formal post-secondary degree/certificate/diploma programmes were considered in this selection. Exceptions include the following: "interest"/recreation-type courses, which typically do not represent any sort of formal human capital investment and which should not generally have a direct effect on early labour market outcomes; banking and insurance certificates, which are normally gained largely as a matter of a course by those on certain career paths; non-professional health certificates which, by their very designation, are not generally career related; high school diplomas, which are deemed to largely represent an accreditation formality without direct effects on labour market outcomes for those already possessing post-secondary diplomas; and registered apprenticeships, which are again seen to be part of a normal career path rather than additional formal schooling *per se*.

[8] The use of selection criteria based on student status as of the interview dates is precluded by the fact that this information is – perhaps surprisingly – missing from all surveys except one (1987). Furthermore, a strong argument can be made for retaining full-time workers who also happen to be students on the grounds that such individuals are first and foremost in the labour force and rightly belong in any analysis of earnings patterns – thus further justifying the use of the selection criteria based on labour force status used here rather than student status.

Finally, observations were deleted where the required information was missing, took extreme values (in the case of earnings), or was otherwise deemed unusable.[9] The results of applying these selection rules to the NGS databases by sex and level of education are shown in Appendix A.

2.2 The Decomposition Method and the Econometric Models

2.2.1 The Decomposition Method

The decomposition analysis essentially follows standard conventions.[10] First, earnings models are estimated for each group of graduates – by level of education (College, Bachelor's, Master's, Ph.D.) and sex – using the information gathered during the two interviews carried out for each cohort, two and five years after graduation (1984/87 for the 1982 graduates, 1988/91 for the 1986 graduates, and 1992/95 for the 1990 graduates).

These results – 48 regressions in all – are then used to analyse the change in the structure of the mean earnings levels for each sex-education group from the first and second interviews of the first cohort to the corresponding points in time for the later two cohorts by identifying the effects of changes in the mean values of the explanatory variables (field of study, labour market experience, province of residence, individual characteristics, *etc.*) and the effects due to changes in the associated coefficient estimates.[11]

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[9] In particular, full-time workers with less than $5,000 ($1995) in earnings were deleted (the equivalent of a wage of about $3.20 per hour for 30 hours of work per week over 52 weeks). This affected no more than approximately one-half of 1 percent of the sample in each year, with a relatively high proportion of the first interview cases (where there were generally more such low earners) being individuals who then obtained a new diploma by the subsequent interview, suggesting the relevant jobs were research assistantships which are rather unlike more conventional forms of employment. "Other" workers (non-paid/self-employed) were also eliminated from the analysis, since the labour force status and earnings levels of such individuals are likely to depart from standard norms and such workers were, furthermore, missing information for the full set of variables included in the regression analysis, resulting in the deletion of a similarly small number of individuals (under one-half of one percent).

[10] See Cain [1986] for a thorough exposition of the decomposition method.

[11] The effects of the changes in the explanatory variables (the first term in the decomposition) have been evaluated using the coefficient estimates obtained for the first cohort, while the effects of the changed coefficient estimates (the second term) have been evaluated using the mean levels of the later cohorts. As in any such exercise, the decomposition algebra could have been reversed, but in a situation where the choice is effectively arbitrary due to the absence of any theoretical imperative for using one set of calculations or the other, this breakdown would seem to have a certain intuitive appeal: i) the effects of the changes in the "rates of return" (*i.e.*, the coefficients) given the later (*i.e.*, most recent) characteristics, ii) the effects of the changed characteristics given the original rates of return. Comparisons of the decompositions using the reversed breakdowns generated similar overall results to those reported here (*i.e.*, overall coefficient/characteristic effects), while the effects of specific variables were somewhat more variable, as would be expected, due to the changes in certain coefficients across years.

2.2.2 The Earnings Models

The regression models used in the analysis conform to standard conventions adapted to the post-graduation period captured by the NGS data, with annual earnings taken to be a function of series of variables representing the individual's human capital and other factors that affect earnings.

The earnings variable available on the NGS databases represents what the person would earn on an annual basis were the current job to last the full year, regardless of the actual job status. In adjusting for irregular work patterns in this manner, the measure represents the individual's rate of pay as measured on an annual basis, rather than the amount necessarily earned. It is a somewhat unconventional measure, but well-defined, analytically interesting, and presumably well reported (being a figure individuals should either know or be able to calculate rather easily). All earnings values are given to the nearest thousand, expressed in constant 1995 dollars, and capped at the $99,000 upper limit which characterises the 1984 data (the lowest bound in the six databases), or $143,035 in constant 1995 dollars.[12]

Earnings are specified in their actual dollar level, not the natural log, as is often used in such models. This choice stems largely from the fact that the effects represented by coefficient estimates in a log specification are, strictly speaking, correct only at the precise point estimates due to the function's non-linearity, and increasingly depart from the underlying true effects the further any such calculations move from the point where those marginal changes correctly apply (*i.e.*, the fitted "Xb" effects become increasingly worse approximations to the true effects as they

[12] Failing to apply a common cap would distort comparisons of earnings levels across survey years because the years with the higher caps (generally the later ones – although there was some inflation-based erosion of the cap value in the most recent periods) tend to have higher earnings values simply due to the capping effects *per se* (as verified empirically). Applying a common cap thus provides a consistent measure of earnings across years – at least for earnings values below the cap. Following up on this latter point, this consistency comes, however, at the cost of a general downward bias in measured mean earnings levels; furthermore, with the cap applied, any *changes* in earnings at the *highest* levels (*i.e.*, beyond the cap) are not observed and are, therefore, effectively set to zero, which could affect cross-year comparisons of average earnings levels and/or the decomposition exercise. To attempt to minimize this latter problem, all relevant observations would have to be deleted, introducing a competing set of biases. Faced with these trade-offs and the associated choices of i) simply using the variable caps which were applied to each year of data, ii) deleting the problem observations (*i.e.*, those beyond the caps), and iii) applying a common cap to all years of data, the decision was taken to apply the common cap. In practice, very few graduates had earnings beyond the cap: never more than one-half of 1 percent of the sample in any given year; on the other hand, tests show that this is a sufficient number of observations to significantly affect certain calculations/ comparisons, particularly because such high earners tend to be concentrated in certain education level-sex groups, thus verifying the importance of the adjustment.

move the function from the neighbourhood where the linearisation strictly holds). In the present case, this general margin of error is sometimes important, with significant consequences for the decomposition exercise, because some of the coefficient estimates are in fact quite large and/or shift significantly across certain equations.[13]

The linear models were, therefore, chosen over the log specifications for these very practical reasons, but with this decision perfectly defensible on theoretic-econometric grounds as well – with the two approaches generating similar results in any event.[14] Furthermore, the linear specification also makes for direct comparisons of the decomposition results across groups and over time which some readers might find appealing, as the effects are expressed in (real) dollar terms rather than the percentage terms which depend on the baseline point of comparison (*i.e.*, the percentage effects are basically evaluated around each particular sample' means) which characterise such comparisons based on log earnings models. The effects are, however, expressed in percentage terms as well (relative to the mean earning values of the earliest cohort for each group) – with those values being close to what would be generated with a log earnings model.

2.2.3 The Variables Included in the Models

The models include variables meant to capture i) the amount – and type – of education-related human capital, such as field of study and already holding a more advanced degree; ii) on-the-job work experience (both pre- and post-program), to capture related human capital accumulations and other experience-related influences (*e.g.*, the outcomes of search/matching processes); iii) job characteristics, such as being self-employed, being in a temporary job, and sector of

[13] The importance of these non-linear approximation errors was tested empirically, and a first set of results based on the natural log specification indicated that the related decomposition algebra was in some cases distorted to a significant degree – that is, the results yielded some overly strong effects due to the estimates being applied beyond the marginal changes where they correctly apply. The linear models produced coefficient estimates and standard errors which were similar to those of the log models (once transformed into percentage effects), but which generated "cleaner" (more robust) decomposition results due to their reduced insensitivity to non-marginal effects.

[14] Once the simple theoretically derived Mincerian benchmark model (where log earnings are regressed on years of schooling and a quadratic in labour market experience) is departed from – which is invariably the case in any specific practical application – the log specification is no longer necessarily superior to the linear variant, and it is largely due to convenience (the coefficients are interpretable as percentage effects) and convention that the former is more commonly used than the latter. That is, there is no general theoretical or technical reason to prefer the natural log specification over the linear form, essentially leaving model choice to be determined by practical considerations – what works best in a specific context – and personal preference.

employment; iv) marital status and the presence of children, reflecting further human capital influences and/or supply side choices; and v) province/region of employment and language spoken at home.

While each of the 1982, 1986, and 1990 databases contains other variables of interest, the nature of the decomposition exercise necessitates that the specifications be restricted to variables available and defined in a relatively consistent fashion across all three cohorts so that the appropriate cross-cohort comparisons may be carried out. It was also deemed desirable to restrict the models to variables which could reasonably be considered as purely exogenous, so as to obviate the need to deal with issues relating to the potential endogeneity of the regressors and to allow the coefficients to be interpreted in terms of the effects of individuals' characteristics and the attributes of their jobs on earnings – that is, "effects" rather than "associated outcomes."[15]

Based on these basic principles, the regression models contain the following variables, all of which are defined in a consistent fashion across all three cohorts (except for the one minor exception mentioned). Appendix B includes more detailed documentation of the variables.

i) Education Characteristics

- *Field of study:* 15 discipline groups at the university level and 16 groups at the college level, reflecting roughly comparable subject material and similar earnings patterns as determined by a preliminary analysis conducted at the specific discipline level across the six points in time covered by the data.[16] *General social sciences* is the omitted group in the regressions.
- *A previously obtained higher degree*: a dummy variable indicating that the individual held a higher degree than the program from which he or she graduated in the sample year (*e.g.*, an individual who graduated with a Bachelor's degree in 1982 who already held a Master's degree).

[15] For example, the job-education skill match variables available on the NGS files might well be endogenous to the wage determination process and were, therefore, excluded.

[16] The graduate's level and field of study is that corresponding to the degree which was the basis of inclusion in the NGS sample (*i.e.*, as awarded in the sample year – 1982, 1986, or 1990) as opposed to any previously obtained degree, even if that other degree was a higher one (*e.g.*, an individual who had returned to school to do a Bachelor's degree after already holding a Master's degree were treated in terms of the former rather than the latter).

ii) Work Experience and Age

- *Pre-program work experience:* a dummy variable indicating the individual had five or more years of full-time work experience before completing the program.
- *Age:* two dummy variables indicating the individual was i) two to seven years older than the level-specific mean age (the average across all three cohorts), or ii) more than seven years older than the mean.[17]
- *Post-graduation work experience:* proxied with indicators of part-time and full-time work status at various specific points in time since graduation – two dates between graduation and the first interview in the case of the first interview regressions; the addition of the first interview employment status to the second interview regressions. *Not working* is the omitted category in each case, allowing the coefficients to be interpreted as the returns to experience.

iii) Job Characteristics

- *Temporary job status*: a dummy variable indicating the individual held a temporary (as opposed to permanent) job.
- *Self-employed*: a dummy variable indicating self-employment (as opposed to being a paid worker).
- *Sector of employment*: dummy variables representing thirteen different industrial sectors. *Business Services* is the omitted sector.

iv) Marital Status/Number of Children

The specific variables included allow for the effects of children to vary by marital status:

- *Single (never married), with/without children.*
- *Married, with/without children.*
- *Widowed Separated Divorced, with/without children.*

Single, no children is the omitted category.

[17] The specific combination of experience and age dummy variables employed here was derived from test runs where each additional year of experience and age was included separately, with the chosen variables representing the clearest cut-points in these functions.

iv) Province/Language

The specific choice of variables allows for "majority" and "minority" language effects as well as provincial/regional differences, with the language variables pertaining to the one first spoken (which is the most consistent language measure across cohorts):

- *Atlantic Canada, Quebec, Manitoba/Saskatchewan, Alberta, British Columbia and the Territories*: a series of dummy variables representing the graduate's current province of residence.
- *Quebec-English*: captures the effect of being an anglophone in Quebec, leaving the Quebec variable on its own to represent (primarily) francophone residents of that province.
- *Minority French*: captures the effect of being a francophone outside of Quebec, leaving the provincial/regional indicators noted above to represent anglophones in those areas (assuming a common effect across provinces).
- *Other language*: captures non-French/English speakers (again assuming a common effect across provinces – including Quebec).

Ontario – representing anglophone Ontarians – is the omitted category in the regressions.

3. Employment Rates and Earnings Levels

This section provides a brief overview of the school-to-work transition of the three recent cohorts of post-secondary graduates in terms of employment rates and mean earnings levels as of two and five years after graduation.[18]

3.1 Employment Rates

Table 1 shows the labour force activity rates of the graduates in the working samples. Unemployment rates were generally quite low for all graduates, but tended to be lowest of all for those at the more advanced degree levels, ranging from as low as 2 percent for some of the classes of Ph.D. graduates in certain years to a maximum of 11 percent for College graduates in certain years.[19] These rates are considerably below those of all labour force participants of the relevant age groups taken together (*i.e.*, including both post-secondary graduates and others), with the general rates for all younger workers generally ranging from 10 to 20 percent, thus implying rates considerably higher than these for non-post-secondary graduates taken alone (see Finnie [1998a] for the relevant comparisons based on standard Labour Force Survey data). The graduates' rates also generally compare rather favourably to those of men and women of all ages taken together, thus further distancing college and university graduates from "the youth unemployment problem" – an obviously important distinction to make, particularly for policy purposes.

Secondly, the unemployment situation generally improved rather dramatically from two to five years following graduation, with unemployment rates declining everywhere, usually significantly so, and sometimes halving or dropping even further over this three year interval – *albeit* with some variation around these general tendencies by cohort, level of education, and sex.[20]

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[18] The material in this section is covered at a deeper level in Finnie [1998a].

[19] The definitions used here depart slightly from the standard labour force definitions with respect to on-going students due to the missing current enrolment status in most years' data (see the note above). Part-time students looking for work are normally counted as being unemployed, while full-time students looking for work are not (they are deemed to not be "ready for work" due to their full-time student status). In this study, however, being unable to ascertain current enrolment status in a consistent fashion across all NGS surveys (as previously discussed), all individuals looking for work – *including* full-time students – are considered as being unemployed. The unemployment rates presented here are, therefore, slightly biased upwards relative to what would be obtained with a more conventional definition.

[20] The central element of Finnie [1998b] is the transition theme – how outcomes evolve over the early years in the labour market. See Betts, Ferrall, and Finnie [1998] for an analysis of the specific issue of time to first job.

Table 1: Employment Rates (% Distribution)

1982 Cohort

	1984			*1987*		
	Employed			Employed		
	Full	Part	Unemployed	Full	Part	Unemployed
COLLEGE:						
Male	84	5	11	89	4	7
Female	79	12	9	79	16	5
BACHELOR'S:						
Male	85	6	9	92	4	4
Female	79	12	9	81	14	5
MASTER'S:						
Male	89	4	6	92	6	2
Female	80	11	8	81	15	4
DOCTORATE:						
Male	89	4	6	93	4	3
Female	87	6	7	89	9	2

1986 Cohort

	1988			*1991*		
	Employed			Employed		
	Full	Part	Unemployed	Full	Part	Unemployed
COLLEGE:						
Male	85	4	11	86	4	10
Female	80	12	8	81	13	7
BACHELOR'S:						
Male	84	5	10	90	4	7
Female	78	13	9	81	14	6
MASTER'S:						
Male	87	6	7	90	6	4
Female	80	12	7	81	15	4
DOCTORATE:						
Male	91	4	4	96	2	2
Female	82	10	8	86	11	3

1990 Cohort

	1992			*1995*		
	Employed			Employed		
	Full	Part	Unemployed	Full	Part	Unemployed
COLLEGE:						
Male	84	5	11	90	4	7
Female	77	13	10	79	14	7
BACHELOR'S:						
Male	84	6	10	92	3	5
Female	78	13	10	82	13	5
MASTER'S:						
Male	86	7	7	89	5	6
Female	81	12	7	82	13	5
DOCTORATE:						
Male	92	3	5	94	3	4
Female	87	7	7	85	9	6

Note: Samples exclude graduates who had completed a new diploma by the relevant interview.

Third, and most pertinent to this paper, the unemployment rates show only a very slight upward trend across cohorts, with rates generally stable or rising only one percentage point or so from the first to last set of graduates (by sex and degree level), with some of the later groups actually showing declines at either the two- or five-year interviews. (The two interviews were at roughly similar points in the business cycle for the first and third cohorts, thus allowing the results to be interpreted in terms of holding cyclical effects more or less constant). Thus, in addition to enjoying unemployment rates which have generally been much lower than those of the general population, post-secondary graduates also appear to have experienced no significant general deterioration in employment opportunities from the early 1980s into the middle 1990s.

Turning to part-time work, there are various interesting trends by gender and level of education, but perhaps the most interesting outcome is – similar to the unemployment rates – the absence of any clear shift across cohorts. At a time when it is often taken for granted that there have been significant increases in the rates of "non-standard work" in general, and part-time work in particular, and where these are typically assumed to represent demand-side forces (*i.e.*, the absence of full-time job opportunities), the data provide no empirical evidence of this phenomenon amongst post-secondary graduates. Indeed, comparing the first and last set of graduates, there were more declines than increases in the percentage of part-time workers amongst the various sex-education groups over the relevant 1984-92/1987-95 comparison periods.

3.2 Mean Earnings Levels

Table 2 reports the mean real earnings of graduates who were working full-time as of the relevant interview dates. (See Appendix C for the patterns with part-time workers included). Mean earnings are substantially higher at each level of education from College through Master's. Over all survey years, the difference in annual earnings between College and Bachelor's graduates ranges from $6,000 to $10,200, averaging approximately $8,300 for men and $8,700 for women. The differences between Bachelor's and Master's graduates were generally greater, ranging from $10,000 to $14,000, and averaging $12,700 for men and $11,300 for women. Finally, at the Ph.D. level, mean earnings generally dipped slightly from what Master's graduates

earned in the case of men (except 1995, when earnings were basically equal), while they rose further for women.

Table 2: Mean Earnings (1995 Constant Dollars)

	1982 Cohort			1986 Cohort			1990 Cohort		
	2 Years (1984) $	5 Years (1987) $	Change (84-87) %	2 Years (1988) $	5 Years (1991) $	Change (88-91) %	2 Years (1992) $	5 Years (1995) $	Change (92-95) %
COLLEGE:									
Male	29,700	36,600	23	29,400	35,500	21	29,700	35,300	19
Female	24,900	28,200	13	25,100	28,700	14	27,000	29,700	10
Female Ratio (%)	84	77		85	81		91	84	
BACHELOR'S:									
Male	37,400	47,000	26	37,600	44,700	19	35,700	43,800	23
Female	32,700	38,400	17	33,500	38,900	16	33,600	38,500	15
Female Ratio (%)	87	82		89	87		94	88	
MASTER'S:									
Male	51,400	57,500	12	50,600	55,700	10	50,500	56,500	12
Female	44,400	48,400	9	45,500	48,900	7	46,000	50,400	10
Female Ratio (%)	86	84		90	88		91	89	
DOCTORATE:									
Male	49,700	56,300	13	49,100	54,400	11	49,300	55,900	13
Female	46,700	50,700	9	47,300	52,400	11	49,400	53,800	9
Female Ratio (%)	94	90		96	96		100	96	

Note: Samples exclude graduates who had completed another diploma by the relevant interview.

A second main point is that mean earnings generally rose substantially from two to five years following graduation, the percentage increases varying from a minimum of 7 percent for 1986 female Master's graduates to as much as 26 percent for 1982 male Bachelor's graduates. Interestingly, earnings growth was uniformly greater (in percentage terms) for College and Bachelor's graduates than at the Master's and Ph.D. levels, the latter thus being characterised by higher, but flatter, post-graduation earnings profiles.

Third, mean earnings were in almost all cases higher for men than women, with women's mean earnings varying from 77 percent to 100 percent the level of men's for a given education group in a given year (see the "Female Ratio" rows in Table 2). The differences generally vary inversely with education level, with women's earnings being closest to men's amongst Ph.D. graduates, next nearest at the Bachelor's and Master's levels, and lagging furthest behind amongst College graduates. On the other hand, women's relative earnings rose in each succeeding cohort – for each education group at each of the interview dates, with the gender

earnings gap generally declining by 30-55 percent from the first cohort to the third amongst College, Bachelor's, and Master's graduates.

Along the other time dimension, however, men's mean earnings rose more than women's from two to five years following graduation for every set of graduates except Ph.D. graduates of the middle cohort, and especially amongst College and Bachelor's graduates, and there was no obvious shift in these patterns across cohorts. Thus, while female graduates' earnings profiles shifted up towards the males' profiles with each succeeding cohort in terms of the starting *levels*, there was no comparable change in the *slopes* of those profiles.

Most important to the major themes of this paper, however, are the cross-cohort earnings patterns for given sex-education groups. Focusing on the first and last sets of graduates (with the relevant two year (1984/92) and five year (1987/95) interview dates being at roughly comparable points in the business cycle), men's mean earnings were stable to moderately lower for the later graduates, depending on the specific educational level and interview year. The specific changes were as follows: no change (two years after graduation) and a 3.6 percent decline (five years) for College level men, declines of 4.5 and 6.8 percent – the sharpest drops – for Bachelor's graduates, more moderate declines of 1.8 and 1.7 percent for Master's men, and almost negligible changes of .8 and .7 percent for males at the Ph.D. level.

For women, on the other hand, mean earnings were uniformly higher amongst graduates of the later cohorts than the earlier ones, in some cases quite substantially so. Furthermore, in almost every case, the increases came steadily over time, with earnings first rising from the first cohort to the second and then from the second to the third (the only exception being the 1 percent decline in the mean earnings of Bachelor's graduates from 1991 to 1995). The specific increases from the first cohort to the third were: 8.4 (two years after graduation) and 5.3 percent (two years after graduation) for College level women, 2.8 and .3 percent (the smallest increases) for females at the Bachelor's level, 3.6 and 4.1 percent for Master's graduates, and 5.8 and 6.1 percent for Ph.D. women.

4. The Decomposition Results

We now turn to the results of the decomposition analysis, reported in Table 3. (See Appendix D for the results with part-time workers included.) In each case the decompositions are shown for the two and five year interview points for the 1982-86 and 1982-90 cohort comparisons (1984-88/92, 1987-91/95). The effects are broken down by the variable groups described above, with the effects of the changes in the coefficients ("Beta") and the changes in the mean characteristics ("X"), each given in both dollar and percentage terms, with the latter calculated relative to the 1982 cohort's baseline mean earnings values. Thus, the dollar effects sum (approximately) to the differences in mean earnings across cohorts shown in Table 1, and the percentages correspond to these dollar amounts.[21]

4.1 Framing the Discussion

In many cases, graduates in the second and third cohorts had mean earnings levels that did not differ a great deal from those of the first cohort, perhaps leading us to conclude that nothing of significance had happened to the structure of earnings. The decompositions allow us, however, to dig deeper into the underlying processes to see where there were various offsetting shifts in the characteristics of graduates and the associated regression coefficients which might be concealed by any relative stasis in earnings levels. We can, for example, see where changes in the structure of earnings (represented in the coefficients), have perhaps put downward pressures on earnings while the characteristics of graduates (fields of study, accumulated work experience, *etc.*) have shifted in such a way as to neutralise those forces, how different groups of variables may have affected earnings patterns in different ways, and so on.

That is, we are not limited to analysing just the observed changes in mean earnings levels from one cohort to another – which are sometimes small – but may instead investigate the manner in which the overall structure of earnings has shifted over the time, with the changes in the observed means comprising only the net effect of the various influences.

[21] The changes are not exactly the same as those implied in Table 1 due to the differences in the samples used in the regressions.

Table 3: Decomposition Results

College: 1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	550	2.1	0	0.0	**550**	**2.1**	3,960	10.8	0	0.0	**3,960**	**10.8**
Ed. Chars.	4,040	15.1	-160	-0.6	**3,880**	**14.5**	1,630	4.4	-20	-0.1	**1,610**	**4.4**
Work Exp.	-4,840	-18.1	10	0.0	**-4,830**	**-18.1**	-5,970	-16.3	-760	-2.1	**-6,730**	**-18.4**
Job Chars.	2,000	7.5	-310	-1.2	**1,690**	**6.3**	230	0.6	-590	-1.6	**-360**	**-1.0**
Marr./Chil.	290	1.1	-30	-0.1	**260**	**1.0**	940	2.6	-100	-0.3	**840**	**2.3**
Province	-1,770	-6.6	-60	-0.2	**-1,830**	**-6.9**	-80	-0.2	-390	-1.1	**-470**	**-1.3**
Total	260	1.0	-540	-2.0	**-280**	**-1.0**	710	1.9	-1,850	-5.0	**-1,140**	**-3.1**
Females:												
Intercept	1,070	4.3	0	0.0	**1,070**	**4.3**	7,740	27.4	0	0.0	**7,740**	**27.4**
Ed. Chars.	1,140	4.6	-140	-0.6	**1,000**	**4.0**	520	1.8	-290	-1.0	**230**	**0.8**
Work Exp.	-1,730	-7.0	90	0.4	**-1,640**	**-6.6**	-4,820	-17.1	-440	-1.6	**-5,260**	**-18.6**
Job Chars.	2,660	10.7	-310	-1.2	**2,350**	**9.4**	560	2.0	-100	-0.4	**460**	**1.6**
Marr./Chil.	-300	-1.2	20	0.1	**-280**	**-1.1**	-620	-2.2	-10	0.0	**-630**	**-2.2**
Province	-2,160	-8.7	-70	-0.3	**-2,230**	**-9.0**	-1,850	-6.5	-160	-0.6	**-2,010**	**-7.1**
Total	690	2.8	-400	-1.6	**290**	**1.2**	1,510	5.3	-1,010	-3.6	**500**	**1.8**

College: 1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	7,180	26.9	0	0.0	**7,180**	**26.9**	5,010	13.7	0	0.0	**5,010**	**13.7**
Ed. Chars.	-3,100	-11.6	510	1.9	**-2,590**	**-9.7**	-520	-1.4	560	1.5	**40**	**0.1**
Work Exp.	-3,050	-11.4	930	3.5	**-2,120**	**-7.9**	-3,280	-8.9	550	1.5	**-2,730**	**-7.4**
Job Chars.	-740	-2.8	-230	-0.9	**-970**	**-3.6**	-3,490	-9.5	-750	-2.0	**-4,240**	**-11.6**
Marr./Chil.	640	2.4	90	0.3	**730**	**2.7**	410	1.1	-100	-0.3	**310**	**0.8**
Province	-2,320	-8.7	150	0.6	**-2,170**	**-8.1**	430	1.2	-50	-0.1	**380**	**1.0**
Total	-1,400	-5.2	1,440	5.4	**40**	**0.1**	-1,430	-3.9	210	0.6	**-1,220**	**-3.3**
Females:												
Intercept	8,480	34.1	0	0.0	**8,480**	**34.1**	3,170	11.2	0	0.0	**3,170**	**11.2**
Ed. Chars.	-1,370	-5.5	100	0.4	**-1,270**	**-5.1**	-1,270	-4.5	90	0.3	**-1,180**	**-4.2**
Work Exp.	-4,300	-17.3	800	3.2	**-3,500**	**-14.1**	900	3.2	650	2.3	**1,550**	**5.5**
Job Chars.	920	3.7	-60	-0.2	**860**	**3.5**	-940	-3.3	80	0.3	**-860**	**-3.0**
Marr./Chil.	90	0.4	70	0.3	**160**	**0.6**	200	0.7	-110	-0.4	**90**	**0.3**
Province	-2,620	-10.5	80	0.3	**-2,540**	**-10.2**	-1,320	-4.7	-30	-0.1	**-1,350**	**-4.8**
Total	1,190	4.8	1,000	4.0	**2,190**	**8.8**	740	2.6	670	2.4	**1,410**	**5.0**

Continued...

Table 3 (Cont.)

Bachelor's: 1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	5,070	13.6	0	0.0	**5,070**	**13.6**	4,660	9.9	0	0.0	**4,660**	**9.9**
Ed. Chars.	1,250	3.3	140	0.4	**1,390**	**3.7**	3,790	8.0	-160	-0.3	**3,630**	**7.7**
Work Exp.	-4,120	-11.0	940	2.5	**-3,180**	**-8.5**	-6,710	-14.2	-130	-0.3	**-6,840**	**-14.5**
Job Chars.	-1,340	-3.6	40	0.1	**-1,300**	**-3.5**	-2,520	-5.4	-270	-0.6	**-2,790**	**-5.9**
Marr./Chil.	-220	-0.6	40	0.1	**-180**	**-0.5**	970	2.1	-130	-0.3	**840**	**1.8**
Province	-1,340	-3.6	-110	-0.3	**-1,450**	**-3.9**	-1,620	-3.4	-210	-0.4	**-1,830**	**-3.9**
Total	-700	-1.9	1,050	2.8	**350**	**0.9**	-1,420	-3.0	-910	-1.9	**-2,330**	**-4.9**
Females:												
Intercept	-850	-2.6	0	0.0	**-850**	**-2.6**	5,710	14.9	0	0.0	**5,710**	**14.9**
Ed. Chars.	1,740	5.3	220	0.7	**1,960**	**6.0**	250	0.7	450	1.2	**700**	**1.8**
Work Exp.	-1,720	-5.2	670	2.0	**-1,050**	**-3.2**	-4,980	-13.0	250	0.7	**-4,730**	**-12.4**
Job Chars.	880	2.7	40	0.1	**920**	**2.8**	270	0.7	-90	-0.2	**180**	**0.5**
Marr./Chil.	870	2.7	-30	-0.1	**840**	**2.6**	540	1.4	20	0.1	**560**	**1.5**
Province	-1,130	-3.4	-30	-0.1	**-1,160**	**-3.5**	-1,650	-4.3	-100	-0.3	**-1,750**	**-4.6**
Total	-210	-0.6	870	2.7	**660**	**2.0**	130	0.3	530	1.4	**660**	**1.7**

Bachelor's: 1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	2,010	5.4	0	0.0	**2,010**	**5.4**	2,030	4.3	0	0.0	**2,030**	**4.3**
Ed. Chars.	2,090	5.6	20	0.1	**2,110**	**5.6**	2,710	5.8	-360	-0.8	**2,350**	**5.0**
Work Exp.	-4,000	-10.7	860	2.3	**-3,140**	**-8.4**	-4,160	-8.8	650	1.4	**-3,510**	**-7.5**
Job Chars.	-810	-2.2	-70	-0.2	**-880**	**-2.4**	-3,170	-6.7	60	0.1	**-3,110**	**-6.6**
Marr./Chil.	180	0.5	-40	-0.1	**140**	**0.4**	-210	-0.4	-150	-0.3	**-360**	**-0.8**
Province	-1,810	-4.8	20	0.1	**-1,790**	**-4.8**	-870	-1.8	180	0.4	**-690**	**-1.5**
Total	-2,300	-6.2	790	2.1	**-1,510**	**-4.0**	-3,680	-7.8	390	0.8	**-3,290**	**-7.0**
Females:												
Intercept	920	2.8	0	0.0	**920**	**2.8**	530	1.4	0	0.0	**530**	**1.4**
Ed. Chars.	1,390	4.2	-70	-0.2	**1,320**	**4.0**	1,060	2.8	230	0.6	**1,290**	**3.4**
Work Exp.	-720	-2.2	330	1.0	**-390**	**-1.2**	-50	-0.1	150	0.4	**100**	**0.3**
Job Chars.	-290	-0.9	30	0.1	**-260**	**-0.8**	-990	-2.6	-300	-0.8	**-1,290**	**-3.4**
Marr./Chil.	960	2.9	-10	0.0	**950**	**2.9**	830	2.2	-10	0.0	**820**	**2.1**
Province	-1,890	-5.8	10	0.0	**-1,880**	**-5.7**	-1,360	-3.6	90	0.2	**-1,270**	**-3.3**
Total	370	1.1	300	0.9	**670**	**2.0**	30	0.1	160	0.4	**190**	**0.5**

Continued...

Table 3 (Cont.)

Master's: 1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	1,430	2.8	0	0.0	**1,430**	**2.8**	5,450	9.5	0	0.0	**5,450**	**9.5**
Ed. Chars.	3,810	7.4	360	0.7	**4,170**	**8.1**	3,330	5.8	790	1.4	**4,120**	**7.2**
Work Exp.	-7,470	-14.5	-510	-1.0	**-7,980**	**-15.5**	-6,510	-11.3	-1,220	-2.1	**-7,730**	**-13.4**
Job Chars.	1,060	2.1	10	0.0	**1,070**	**2.1**	-1,490	-2.6	480	0.8	**-1,010**	**-1.8**
Marr./Chil.	1,670	3.2	-200	-0.4	**1,470**	**2.9**	-1,500	-2.6	-330	-0.6	**-1,830**	**-3.2**
Province	-500	-1.0	10	0.0	**-490**	**-1.0**	-290	-0.5	-120	-0.2	**-410**	**-0.7**
Total	-10	0.0	-340	-0.7	**-350**	**-0.7**	-1,000	-1.7	-390	-0.7	**-1,390**	**-2.4**
Females:												
Intercept	330	0.7	0	0.0	**330**	**0.7**	7,200	14.7	0	0.0	**7,200**	**14.7**
Ed. Chars.	-2,410	-5.4	70	0.2	**-2,340**	**-5.2**	-20	0.0	330	0.7	**310**	**0.6**
Work Exp.	-280	-0.6	450	1.0	**170**	**0.4**	-4,480	-9.2	-130	-0.3	**-4,610**	**-9.4**
Job Chars.	3,310	7.4	-210	-0.5	**3,100**	**6.9**	360	0.7	-220	-0.4	**140**	**0.3**
Marr./Chil.	710	1.6	80	0.2	**790**	**1.8**	-1,500	-3.1	30	0.1	**-1,470**	**-3.0**
Province	-1,680	-3.8	60	0.1	**-1,620**	**-3.6**	-1,950	-4.0	-30	-0.1	**-1,980**	**-4.0**
Total	-10	0.0	450	1.0	**440**	**1.0**	-390	-0.8	-20	0.0	**-410**	**-0.8**

Master's: 1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	4,340	8.4	0	0.0	**4,340**	**8.4**	1,950	3.4	0	0.0	**1,950**	**3.4**
Ed. Chars.	2,300	4.5	-210	-0.4	**2,090**	**4.1**	2,360	4.1	-680	-1.2	**1,680**	**2.9**
Work Exp.	-5,400	-10.5	90	0.2	**-5,310**	**-10.3**	-2,790	-4.8	-1,020	-1.8	**-3,810**	**-6.6**
Job Chars.	-170	-0.3	-220	-0.4	**-390**	**-0.8**	-210	-0.4	260	0.5	**50**	**0.1**
Marr./Chil.	1,220	2.4	-140	-0.3	**1,080**	**2.1**	250	0.4	-90	-0.2	**160**	**0.3**
Province	-2,610	-5.1	40	0.1	**-2,570**	**-5.0**	-870	-1.5	-60	-0.1	**-930**	**-1.6**
Total	-320	-0.6	-430	-0.8	**-750**	**-1.5**	690	1.2	-1,600	-2.8	**-910**	**-1.6**
Females:												
Intercept	-2,290	-5.1	0	0.0	**-2,290**	**-5.1**	1,730	3.5	0	0.0	**1,730**	**3.5**
Ed. Chars.	-400	-0.9	50	0.1	**-350**	**-0.8**	100	0.2	240	0.5	**340**	**0.7**
Work Exp.	5,370	12.0	920	2.1	**6,290**	**14.1**	40	0.1	580	1.2	**620**	**1.3**
Job Chars.	610	1.4	90	0.2	**700**	**1.6**	1,090	2.2	-40	-0.1	**1,050**	**2.1**
Marr./Chil.	670	1.5	120	0.3	**790**	**1.8**	130	0.3	90	0.2	**220**	**0.4**
Province	-3,430	-7.7	-120	-0.3	**-3,550**	**-8.0**	-2,240	-4.6	-90	-0.2	**-2,330**	**-4.8**
Total	540	1.2	1,070	2.4	**1,610**	**3.6**	850	1.7	780	1.6	**1,630**	**3.3**

Continued...

Table 3 (Cont.)

Doctorate: 1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	-1,250	-2.5	0	0.0	**-1,250**	**-2.5**	-5,830	-10.3	0	0.0	**-5,830**	**-10.3**
Ed. Chars.	-730	-1.5	-880	-1.8	**-1,610**	**-3.2**	-1,520	-2.7	-780	-1.4	**-2,300**	**-4.1**
Work Exp.	-2,700	-5.4	-130	-0.3	**-2,830**	**-5.7**	5,850	10.4	420	0.7	**6,270**	**11.1**
Job Chars.	4,410	8.8	310	0.6	**4,720**	**9.4**	3,790	6.7	-1,130	-2.0	**2,660**	**4.7**
Marr./Chil.	450	0.9	-180	-0.4	**270**	**0.5**	-3,250	-5.8	-150	-0.3	**-3,400**	**-6.0**
Province	-140	-0.3	-30	-0.1	**-170**	**-0.3**	270	0.5	170	0.3	**440**	**0.8**
Total	30	0.1	-910	-1.8	**-880**	**-1.8**	-680	-1.2	-1,480	-2.6	**-2,160**	**-3.8**
Females:												
Intercept	-14,660	-31.1	0	0.0	**-14,660**	**-31.1**	2,480	4.9	0	0.0	**2,480**	**4.9**
Ed. Chars.	-890	-1.9	-1,390	-2.9	**-2,280**	**-4.8**	-3,900	-7.7	-550	-1.1	**-4,450**	**-8.7**
Work Exp.	11,560	24.5	-630	-1.3	**10,930**	**23.2**	7,730	15.2	-1,070	-2.1	**6,660**	**13.1**
Job Chars.	2,280	4.8	30	0.1	**2,310**	**4.9**	-3,680	-7.2	790	1.6	**-2,890**	**-5.7**
Marr./Chil.	1,400	3.0	-260	-0.6	**1,140**	**2.4**	-670	-1.3	140	0.3	**-530**	**-1.0**
Province	2,440	5.2	-30	-0.1	**2,410**	**5.1**	540	1.1	-350	-0.7	**190**	**0.4**
Total	2,130	4.5	-2,280	-4.8	**-150**	**-0.3**	2,500	4.9	-1,040	-2.0	**1,460**	**2.9**

Doctorate: 1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	-4,270	-8.5	0	0.0	**-4,270**	**-8.5**	-3,070	-5.4	0	0.0	**-3,070**	**-5.4**
Ed. Chars.	2,700	5.4	290	0.6	**2,990**	**6.0**	930	1.6	250	0.4	**1,180**	**2.1**
Work Exp.	420	0.8	220	0.4	**640**	**1.3**	-320	-0.6	930	1.6	**610**	**1.1**
Job Chars.	3,800	7.6	660	1.3	**4,460**	**8.9**	2,520	4.5	220	0.4	**2,740**	**4.9**
Marr./Chil.	-520	-1.0	-240	-0.5	**-760**	**-1.5**	-1,670	-3.0	70	0.1	**-1,600**	**-2.8**
Province	-3,120	-6.2	-10	0.0	**-3,130**	**-6.3**	130	0.2	-40	-0.1	**90**	**0.2**
Total	-990	-2.0	910	1.8	**-80**	**-0.2**	-1,480	-2.6	1,440	2.6	**-40**	**-0.1**
Females:												
Intercept	-24,930	-52.9	0	0.0	**-24,930**	**-52.9**	4,780	9.4	0	0.0	**4,780**	**9.4**
Ed. Chars.	2,080	4.4	-560	-1.2	**1,520**	**3.2**	290	0.6	710	1.4	**1,000**	**2.0**
Work Exp.	19,200	40.7	250	0.5	**19,450**	**41.2**	4,030	7.9	380	0.7	**4,410**	**8.7**
Job Chars.	3,860	8.2	60	0.1	**3,920**	**8.3**	-1,540	-3.0	530	1.0	**-1,010**	**-2.0**
Marr./Chil.	3,150	6.7	-220	-0.5	**2,930**	**6.2**	-3,970	-7.8	-120	-0.2	**-4,090**	**-8.0**
Province	-730	-1.5	-60	-0.1	**-790**	**-1.7**	-2,010	-3.9	-10	0.0	**-2,020**	**-4.0**
Total	2,650	5.6	-530	-1.1	**2,120**	**4.5**	1,590	3.1	1,490	2.9	**3,080**	**6.0**

A second major analytical point is that it is necessary to be wary of changes in the intercept shift which might, at first glance, suggest there has been a generalised shift in earnings levels when this is not in fact the case. The reason is that the myriad categorical variables included in these models result in the intercept term representing the mean earnings level of individuals with a very specific set of characteristics as implicitly defined by the various omitted categories. Those baseline individuals are, to be precise: a social science graduate who did not already hold a higher degree, have any great amount full-time work experience before entering (or completing) the program, or work at any of the points in time between graduation and the relevant interview date (the experience variables are dummy variable indicators of having a part-time or full-time job as of the appropriate dates); who had a permanent (not temporary) job as a paid worker (rather than being self-employed) in the government services sector; who was never married with no children; and who was an English speaking resident of Ontario.

Relatively general shifts in the earnings of graduates may, therefore, take the form of changes in certain particular coefficients which apply to most individuals, or in general shifts in all or most of the dummy variables of a given category. For example – and one which will be seen to be quite common in the following results – a significant upward shift in the intercept from an earlier cohort to a later one may be offset to a substantial degree by the negative effects associated with shifts in the work experience coefficients. That is, the experience coefficients are smaller (less positive) in the later regressions, thereby indicating lower returns to experience and – here is the key point – lower earnings for the great majority of graduates to whom these experience variables apply.

The reference individual's earnings might, therefore, have risen substantially (as represented in the shift in the intercept), but these effects might have been offset by diminished earnings for those individuals with more or less standard amounts of labour market experience – that is, most graduates. Thus, the correct story would be that the earnings differences between graduates with more versus less post-graduation experience narrowed over the relevant interval, but that this relative shift which occurred in the context of a relatively general decline in earnings from the earlier cohort to a later one.

Finally, there are too many results for the discussion to go into each particular finding – the effects associated with each group of variables for each cross-cohort comparison for each sex-education group. The discussion will, instead, focus on the results of most interest and greatest importance, including the more dominant trends affecting graduates' earnings over the period of analysis.[22]

4.2 College Graduates

Males

Overall, the later cohorts of male College graduates had stable to moderately lower mean earnings relative to the first cohort, as seen in the "total" columns of Table 3: declines of $280, or 1.0 percent and $1,140, or 3.1 percent, for the 1986 cohort as of two and five years following graduation; and declines of just $40 (effectively unchanged) and $1,120 (3.3 percent) for the 1990 cohort. These changes were the net outcome of negative characteristics effects being offset by positive coefficient effects for the first cohort, with both these sets of effects and the net change considerably stronger as of five years following graduation (1991) than two years out (1988); and a reverse of these tendencies for the later cohort, with positive characteristic effects offsetting some fairly strong negative coefficient effects as of two years out (1992), and similar coefficient effects with much weaker characteristics offsets as of the five years mark (1995). The market thus first shifted in a favourable way, and then turned against, male college graduates over the period covered, with changes in the characteristics of graduates offsetting these trends to only a very partial degree.

Looking at these trends in more detail, the intercept terms were mostly significantly higher for the later cohorts (the small increase in 1988 being the only exception), and the changes in the coefficients on the educational characteristics are also quite strongly positive for the middle group of graduates (see the 1984-88 and 1987-91 comparisons), while the marriage/children effects are positive as well, but of a much smaller magnitude throughout. These positive coefficient effects are, however, offset by the disadvantageous shifts in the work experience coefficients (significant declines in the coefficients on the part-time and, especially, full-time

[22] When conducting this research, the author prepared a full variable-by-variable listing of the decomposition results – the coefficient and characteristics effects associated with each variable.

experience variables), cautiously interpretable as representing generalised declines in earnings in combination with diminished returns to experience (see the comments in the preceding sub-section on this point). There were also unfavourable shifts in the educational coefficients for the latest cohort (especially in 1992). The job characteristic coefficient effects were, on the other hand, more mixed – significantly positive in 1988, significantly negative in 1992, and small in the other years – and quite generalised, representing general increases or decreases (respectively) in the earnings of individuals working in a broad number of sectors for the most part, as opposed to any more particular changes, although a large decline in the positive coefficient associated with self-employment in 1995 is a notable exception in this regard. The province/language coefficient effects were also somewhat mixed, but in two of the fours periods (1988 and 1992) point to generalised declines in the earnings of individuals living outside of Ontario (the omitted category), with the declines being greatest for Quebec and Alberta.

Turning to the characteristic effects, the overall effects were, as noted, negative for the 1986 graduates and positive for the later groups, and varied in magnitude across interview dates within each cohort, thus indicating the absence of any generalised, secular shifts in earnings due to changes in graduates' fields of study, patterns of work experience, sectors of employment, and so on. Probably the most noteworthy specific findings are moderate increases in the percentage of (lower earning) temporary workers for both years of the first cohort and again in the second year of the later cohort; and a decrease in accumulated post-graduation experience in 1991 (presumably reflecting the recession), but not for the 1990 cohort at either of its two interviews, with the 1992 data actually showing increased accumulations of experience (with commensurately positive earnings effects).

The overall conclusion, then, is that market conditions generally turned against male College level graduates to a moderate degree over the period in question, largely in the form of fairly generalised shifts, along with some evidence of reduced returns to labour market experience and hints of reduced opportunities for obtaining permanent jobs and work experience in the early post-graduation years in certain specific periods.

Females

The underlying trends for the College level women of the second cohort (*i.e.*, 1986 graduates) were similar to those of their male classmates, with the small net changes in earnings – smallish gains for the females as opposed to the small to moderate losses experienced by the males – resulting from the negative effects being not quite so negative and the positive effects being a little more positive, as opposed to any great qualitatively different effects. Thus, the intercept and education effects were positive, the work experience coefficient effects were negative, and so on, with the total coefficient effects being positive and the characteristic effects negative, and the former dominating, to generate the observed gains in mean earnings from 1984 to 1988 and from 1987 to 1991.

For the third cohort, however, the male-female patterns show considerably more divergence. With respect to the coefficient effects, the substantial upward shifts in the intercept (especially from 1984 to 1992) were less than fully offset by negative changes in the education, work experience, and province/language coefficients, thus indicating rather generalised earnings gains for female college graduates ascribable to favourable shifts in the market conditions they faced.[23] There were also the same indications of reduced returns to experience as was seen with the men in 1992, but not in 1995, while the negative province/language effects were more consistent, again driven by declines in the relative earnings of graduates living in Quebec and Alberta. As with the male graduates, the characteristics effects were moderately positive in their overall effect – although here they were almost entirely due to greater accumulations of experience, both up to the point of completing the degree and thereafter.

For female college graduates, then, we could say that their relatively substantial increases in earnings from the first to third cohorts (gains of 8.8 and 5.0 percent as of the first and second interview, respectively) were the result of favourable shifts in the market conditions they faced along with "improved" characteristics, with the greater amounts of work experience which dominate the latter reflecting a combination of increased labour supply and better job opportunities, as opposed to more purely "exogenous" or "predetermined" shifts in characteristics, such as field of study, marital/family effects, or province of residence.

[23] The changes in intercepts or other generalised effects could, alternatively, stem from changes in other factors not accounted for in the models – as is the case in any regression-based analysis.

4.3 Bachelor's Graduates

Males

For male Bachelor's level graduates, earnings were just marginally lower than those which held for the first cohort as of the first interview for the middle cohort (the 1984-88 comparison), but were significantly lower at all other points (1987-91, 1984-92, 1987-95). The first general point to make is that the story is not principally one of changed characteristic, since the combined effects of shifts in graduates' fields of study and other educational characteristics, accumulated work experience, job characteristics, marriage/children, and province of residence and language amount to somewhat under one-half of the decline in the 1987-91 comparison, while the total effect of these influences was actually positive everywhere else, largely driven by the work experience variables.

This obviously leaves the shifts in coefficients to account for the declines. The intercept shifts are strongly positive, and the changes in the education coefficients are also favourable (with particularly important gains for commerce, law, and medical graduates for the 1986 cohort, and for commerce and engineering graduates for the 1990 cohort). These influences are, however, more than offset by the other coefficient effects, dominated by the declines in the returns to on-the-job experience, but also including negative shifts in the coefficients on the job characteristics, especially as of five years following graduation (significantly reduced benefits to being self-employed in 1991, 1992, and 1995 are particularly noteworthy), while the province effects are also quite negative, again dominated by declines for Quebec and Alberta (relative to Ontario), as was the case for college graduates. Returning to the point made earlier, these results are probably best interpreted as representing generalised downward shifts in earnings levels accompanied by a reshuffling of the relative earnings of particular groups of workers, including a general compression in the differences in earnings between those who had been quicker to obtain practical job experience and those who had not.

It would, therefore, appear that the general declines in male Bachelor's graduates' earnings were driven by shifts in market demand conditions rather than any changes in their behaviour or characteristics. Indeed, the results suggest that had the structure of earnings remained constant,

the 1990 cohort would have enjoyed earnings levels somewhat greater than those of the 1982 cohort – rather than the fairly significant declines experienced.[24]

Females

For female graduates, on the other hand, the coefficient effects were also generally small, but generally positive (rather than negative) in all years except 1988. Amongst these, the increased earnings of education graduates are alone worth close to $500 overall in each period, improvements in the relative earnings of married women were also important contributors to the overall gains, while the provincial effects largely resemble those of men (the negative Quebec effects again lead, while the shifts in the Alberta coefficients are not quite so important). With the characteristics effects being similar to or slightly greater than those of men – and thus all positive (with the greatest of these again being the increased accumulations of work experience) – the net result is the smallish gains or at least stability in mean earnings, in contrast to the male losses.

For female Bachelor's graduates, therefore, we can think of the market conditions in the later years, including those related to marital status (the result of work place policies – public and/or private?), working slightly in their favour, rather than against them, while they also made somewhat more rapid movements into part- and full-time job situations following graduation, which pushed their earnings up a bit further.

4.4 Master's Graduates

Males

The later cohorts of male Master's level graduates had lower earnings than the 1984 graduates in all cases, ranging from a small .7 percent decline for the 1986 cohort as of the first interview, to a more significant 2.4 percent for the same group three years later (1987-91), while the 1990 cohort registered declines of 1.5 and 1.6 percent as of the two and five year interview dates.

[24] It should be emphasized that individuals' characteristics are treated as exogenously determined throughout this analysis (as is standard in such studies), and treating some of these as endogenous could potentially change the results significantly. The approach is, in this sense, best thought of as a descriptive exercise, which could lead to more analytical studies focused on the variables found to be particularly important in this first stage analysis.

For the middle cohort (1986 graduates), the characteristics effects drove earnings .7 percent lower as of each interview date, with the experience measures being most important in this regard, especially for the five-year results. More specifically, there were reduced numbers of older and more experienced graduates in 1988, with these same effects plus reduced accumulations of post-graduation experience operating in 1991. These changes more than off-set the positive education effects (increased numbers of commerce and medicine graduates versus some losses due to a smaller number of education graduates), as well as some smaller job characteristics effects related, with the positive effects of a slight rise in the number of (higher earning) self-employed probably being the most interesting.

Turning to the coefficient effects for the middle cohort, many of these were strong individually, but *in toto* the influences were largely countervailing, with the net effects being perfectly nil in 1986 and a negative $1,000 (1.7 percent) in 1991. More specifically, the intercepts shifted upward relative to the baseline 1982 cohort (especially in 1988); the shifts in the education coefficients generated positive overall effects, largely driven by large gains for commerce graduates and smaller increases for those with degrees in education, engineering, and mathematics/physics; the work experience coefficients shifted downwards very sharply, comprising a generalised negative influence on earnings along with a reduction in the experience effects (as already seen and discussed in the context of other groups above); the job characteristics effects went from moderately positive to the reverse from two to five years out, that evolution chiefly due to increasingly negative effects of having a temporary job; the family status variables had a similar positive-then-negative dynamic, principally due to substantial shifts in the marriage premium over the relevant interval; and the province/language effects were moderately negative at both interview points, the smaller effects relative to what was found with the Bachelor's graduates presumably reflecting the different spatial aspects of the labour markets for individuals with more advanced degrees. The coefficient effects thus point to a moderate reshuffling of relative earnings patterns amongst graduates (by field of study, amount of job experience, marital status, *etc.*), amidst a small to moderate generalised downward pressure on earnings, especially as of the second interview date.

The story is a bit different for the 1990 cohort. The characteristics effects are again negative, but more strongly so than for the earlier group, especially as of the second interview date (negative

2.8 percent in 1995). Experience effects are again important in this dynamic, at least for the later year, but stem from a reduction in the percentage of older graduates (who tend to have higher earnings), as post-graduation accumulations of experience are actually greater. These more than offset the unfavourable shifts in graduates' education characteristics (as opposed to the positive effects of the 1986 cohort), driven by declines in the number of education and medical graduates more than offsetting the positive influence of an increased number of commerce graduates.

The overall coefficient effects for the 1990 cohort are, as for the preceding class, slightly negative as of the first interview (1992), but then positive for the second (1995), although the various sets of influences are qualitatively similar to those of the 1986 cohort: favourable shifts in the earnings patterns by field of study similar to those characterising the earlier group; strong experience effects representing generalised decreases in earnings and an apparent reduction in the returns to post-graduation experience, offset to some degree by increases in the premiums to pre-graduation experience; various job characteristics effects, with the declines in the earnings of workers in temporary jobs and the self-employed being most interesting in this regard, but essentially washing out amongst themselves in each year (as opposed to the significantly positive and then negative net effects for the preceding group); shifting family status coefficients, with movements in the marriage premium again being most important; and stronger province effects than for the preceding cohort, with the effects somewhat more generalised (*i.e.*, more generally beyond the Quebec and Alberta effects) than for Bachelor's graduates.

We might, therefore, summarise the analysis of male Master's graduates by saying that although some of the market effects were individually important, and some of the shifts quite interesting (*e.g.*, the increased returns to pre-graduation experience and the declines in the earnings of the self-employed and temporary workers for the 1990 cohort), the overall effects ranged only from quite small and even positive (1988, 1992, 1995) to moderately negative (1991), while changes in graduates' characteristics also had relatively small effects, although uniformly negative in effect overall, until this downward pressure became more significant in 1995. It thus appears that there were no generalised shifts in the market parameters faced by male Master's graduates, with their small to moderate declines in earnings driven principally by various characteristics effects, only some of which could in turn be thought of as being related to market conditions (*e.g.*, post-graduation experience).

Females

For female Master's graduates, mean earnings (in the regression samples) were more or less the same for the 1986 cohort as the baseline 1982 group (a small rise in 1988, a small decline in 1991), and approximately 3.5 percent higher for the 1990 group – all in contrast to the uniform declines experienced by their male classmates, thus generating net gains of about five percent for female graduates relative to male graduates at the Master's level for the most recent group (the female gains of about 3.5 percent versus the male losses of about 1.5 percent at each interview). The underlying factors are fairly diverse and diffuse – with no important secular trends in particular characteristics or coefficient effects operating for female Master's graduates over this period.

More specifically, the characteristics effects were all quite small for the 1986 cohort, with no particularly important changes in field of study, job characteristics, family status, or province/language, although there were some smallish effects due to increases in the numbers of older graduates with more experience and post-graduation accumulations of experience in certain years. The coefficient effects for the 1986 cohort are, as noted, largely offsetting (the net effects are exactly zero and -.8 percent in 1988 and 1991 respectively) and largely devoid of any clear patterns of importance, with the largish shifts by category principally due to changes in the relative earnings patterns of the omitted categories and most other categories within a given group (*e.g.*, shifts in the relative earnings of the omitted education, industry, and province variables shifting the overall intercept and commensurate countervailing shifts of most of the other variables within each group). The only particularly interesting changes are some moderately favourable increases in the earnings of older and more experienced graduates (with the other experience effects being quite mixed); further declines in the already lower earnings of temporary workers (as for males) versus small improvements in the earnings of the self-employed (more favourable than the male situation); some disadvantageous shifts in the earnings of married graduates from two to five years following graduation, turning the family structure effects from moderately positive to distinctly negative over this interval; and the by now familiar negative province effects, these being (as for males) more widespread than amongst Bachelor's graduates.

For the 1990 cohort, there were increased numbers of older graduates and increased post-graduation experience, with these changes principally responsible for the positive characteristics-related effects both two and five years following graduation. Regarding the coefficient effects, there were again increased returns to older, more experienced graduates and to post-graduation experience at the first interview (1992), but more neutral post-graduation experience effects for the second interview (with the overall experience and intercept effects shifting accordingly). As was found for the 1986 cohort, the marriage coefficient effects were positive at the first interview (see the family status effects), but not the second. Finally, the province/language effects were quite strong, representing rather generalised declines in the earnings of graduates living outside of Ontario, with these effects being considerably stronger than the case of men – perhaps reflecting a different dynamic concerning decisions about where to live on the part of men and women.[25]

Overall, then, the record of female Master's graduates was – more than any other group of graduates – largely one of stability over this period, in terms of both characteristics and coefficients, with the most important and interesting shifts being certain changes in the experience variables (both characteristics and coefficient effects), the changes in the relative earnings of married graduates, and the province effects.

4.5 Ph.D. Graduates

Males

Male Ph.D. graduates of the second cohort had slightly to moderately lower earnings than the preceding class (down 1.8 and 3.8 percent at the two interview dates respectively). These declines were largely driven by an increase in the number of fine arts and humanities graduates and a decrease in education graduates (affecting both interviews' results), along with considerably greater numbers of graduates in temporary jobs and fewer self-employed (which pays a premium for these graduates) as of the second interview date – together driving the characteristics effects which dominate the overall changed earnings levels.

[25] The inter-provincial mobility of post-secondary graduates (the patterns and associated changes in earnings) is currently being pursued in research with John Burbidge of McMaster University.

On the other side of the ledger, the coefficient effects are sometimes large, but largely cancel each other out (reflecting the same sort of shifting locus of the generalised effects as discussed for the other groups), together generating moderately negative net effects on mean earnings in each period except the first. Amongst these, the more interesting shifts include the increase in the relative earnings of applied science and health (non-medicine) graduates, along with some large swings in the earnings of fine arts and humanities graduates (significantly higher than the 1982 cohort level at the first interview, then significantly lower at the second interview); increased earnings of older graduates and those with more pre-graduation work experience, while the returns to post-graduation experience were lower at the first interview but higher at the second; further declines in the already lower earnings of temporary workers, but large gains for those working in the educational sector (representing approximately 55 percent of the graduates and, therefore, worth $3,000 - $4,000, thus driving the strong job coefficient effects); and an absence of the province effects seen for the other levels, presumably reflecting the more national scope of the labour markets faced by Ph.D. graduates, while individuals who first spoke a language other than English or French did a significant amount of catching up to others in this cohort.

For the 1990 cohort, male Ph.D. graduates' earnings recovered to levels very close to those of the earliest group. The characteristics effects show a net positive impact on earnings, with the most important changes being an increase in the number of engineering graduates (positive effect); a greater number of older graduates (also positive); more temporary workers as of the second interview (as in the 1986 cohort) and greater numbers of self-employed (rather than the decrease in 1991) comprising offsetting effects in the job characteristics category; and decreases in the percentage of third language graduates (positive effects).

The coefficient effects for the later group of male Ph.D. graduates were, overall, moderately negative. Shifts in earnings by field of study drove up the earnings of fine arts and humanities, medicine, and related health graduates (see the positive education coefficient effects); the age and experience premiums moved around too much from variable to variable and from the first interview to the second to identify any general pattern (with the parallel shifts in the intercept representing the same shifting of the general effects as seen elsewhere); earnings were again significantly higher in the educational sector (predominantly college and university professors); while the province effects were significantly negative in 1992 (the trough of the early-90s

recession), but much less so in 1995, when third language graduates again did significantly better than in the baseline 1982 cohort.

The overall story for male Ph.D. graduates is, then, one of lower overall earnings mostly driven by market factors (including the job characteristics effects related to the increases in temporary jobs and less self-employment) for the middle cohort, but then full recovery to the earnings levels of the baseline group of 1982 graduates for the most recent cohort, for which the various observed shifts in market forces had little net effect on overall mean earnings levels.

Females

For female Ph.D. graduates of the 1986 cohort, mean earnings were 1.3 percent higher over those of the baseline group as of the first interview point, and 3.4 percent higher as of the second, with the latter gains – and indeed the earlier stability – largely the result of favourable shifts in the coefficients, as the characteristics effects tilted their earnings somewhat downward. The negative characteristics effects were, in turn, largely owing to a decline in the proportion of graduates in education and (non-medicine) health disciplines, somewhat offset by a decrease in applied science graduates (who tend to have below average earnings); some mixed shifts in graduates' mean age and both pre- and post-graduation accumulations of labour market experience; and the offsetting (positive) effect of a doubling in the percentage of self-employed graduates at the second interview (worth approximately $1,500 on its own).

The coefficient effects are in many cases large, but are once again mostly off-setting, representing shifts in general effects from one set of variables to another (as discussed above). The most interesting specific coefficient effects include a significant increase in the returns to both pre- and post-graduation experience; a significant improvement in the relative earnings of the self-employed (paying a large premium at the second interview but characterised by lower earnings than regular paid workers at the first); significant improvements in the relative standing of married graduates with children at the first interview but a disappearance of these gains by the second interview; and – in significant contrast to all other groups – *favourable* shifts in the relative earnings of graduates out of Ontario, and *especially* in Quebec.

For the class of 1990, female Ph.D. graduates had substantial gains in mean earnings over both earlier classes: 5.8 and 6.1 percent as of the two interview dates. Once again, the coefficient

effects were quite strongly positive overall, with some of the specific shifts of interest being increased earnings of graduates in commerce, medicine, and other health disciplines (especially in 1992); gains to pre- and post-graduation experience (as for the 1986 cohort); improvements for those working in the educational services sector (as was found for their male classmates); first an improvement and then a deterioration in the relative earnings of married graduates with children (similar to the 1986 cohort); and the same sort of negative province effects as found for other groups (and quite different from the 1986 cohort).

The overall characteristics effects were somewhat unfavourable in 1992, but then (unlike the 1986 cohort) advantageous by the second interview in 1995. The latter stem from an increase in the percentage of engineering graduates (the change from 1 percent to 5 percent worth $2,300 on its own); greater accumulations of labour market experience; an increase in the number of self-employed, offset by an increase in the number of temporary workers; plus some sectoral shifts, including a decrease in the number of female Ph.D. graduates employed in the educational sector (where earnings remained below average, despite the relative gains noted above).

All-in-all, then, female Ph.D. graduates did mostly better over this period – and largely due to favourably shifting market parameters, except for the final period, when their characteristics also contributed to their gains in a substantial manner.

5. Conclusion

We return to the question posed at the outset of this paper: How have recent post-secondary graduates been faring in the labour market of late? The analysis presented here based on the National Graduates Surveys of the classes of 1982, 1986, and 1990 has shown that unemployment rates have been considerably below those of non-graduates of the same age and the working age population in general, declined substantially from two to five years following graduation, and – most significantly – generally held steady across the three cohorts, as did rates of part-time work. Earnings levels have been generally higher at the more advanced educational levels, increased substantially in the early years in the labour market, and – again most importantly – either held steady or shown small-to-moderate declines across cohorts in the case of men, or been stable-to-higher in the case of women.

Thus, while the maximum decline in mean earnings of just under 7 percent found for the Bachelor's level men is hardly trivial, it is perhaps not as great as many might have expected, especially in representing the worst case amongst all sets of graduates. On the other hand, the stable-to-significantly-improved trends in the earnings of female graduates has to be seen as good news at a time when many observers take it for granted that graduates' labour market fortunes have been in decline, and will be seen as a favourable development for those looking for a narrowing of the gender earnings gap.

As for the underlying forces which have been affecting earnings levels, men's earnings levels have for the most part been affected by a combination of moderately adverse shifts in market conditions, as represented in the coefficient effects and certain market-related characteristics effects (*e.g.*, post-graduation experience, job characteristics) plus mixed effects with respect to the changes in their average characteristics (sometimes positive, sometimes negative), with these varying by education level and specific year in question. Female graduates have faced a more varied set of market influences, with the coefficient effects being favourable in the case of the College graduates, generally neutral for Bachelor's level graduates, slightly negative to moderately positive for women with Master's degrees, and quite strongly positive at the Ph.D. level. Females' characteristics effects have also been mixed, affecting earnings most consistently in a positive way at the Bachelor's and Master's level, and less so amongst College and Ph.D.

graduates. Thus, as graduates' earnings patterns have shown no simple general sets of trends, the underlying influences on earnings levels have been similarly mixed.

Appendix A

Sample Selection

1982 Cohort

		2 Years (1984)		5 Years (1987)	
		#	% of Original	#	% of Original
COLLEGE					
Males:	Original Sample	4,639	100	4,158	100
	No New Diploma	4,173	90	3,313	80
	Full-Time Workers	3,385	73	2,719	65
	Regressions	3,107	67	2,518	61
Females:	Original Sample	5,436	100	4,829	100
	No New Diploma	5,019	92	4,067	84
	Full-Time Workers	3,790	70	2,871	59
	Regressions	3,442	63	2,646	55
BACHELOR'S					
Males:	Original Sample	4,752	100	4,126	100
	No New Diploma	4,001	84	2,912	71
	Full-Time Workers	3,153	66	2,513	61
	Regressions	2,856	60	2,286	55
Females:	Original Sample	4,929	100	4,346	100
	No New Diploma	4,148	84	3,134	72
	Full-Time Workers	2,974	60	2,260	52
	Regressions	2,707	55	2,054	47
MASTER'S					
Males:	Original Sample	3,074	100	2,609	100
	No New Diploma	2,886	94	2,223	85
	Full-Time Workers	2,276	74	1,927	74
	Regressions	2,019	66	1,736	67
Females:	Original Sample	2,057	100	1,725	100
	No New Diploma	1,921	93	1,508	87
	Full-Time Workers	1,369	67	1,093	63
	Regressions	1,229	60	959	56
DOCTORATE					
Males:	Original Sample	521	100	431	100
	No New Diploma	501	96	407	94
	Full-Time Workers	434	83	364	84
	Regressions	400	77	341	79
Females:	Original Sample	220	100	190	100
	No New Diploma	214	97	174	92
	Full-Time Workers	174	79	141	74
	Regressions	154	70	129	68

Continued...

Appendix A (Cont.)

1986 Cohort

		2 Years (1988)		5 Years (1991)	
		#	% of Original	#	% of Original
COLLEGE					
Males:	Original Sample	6,364	100	5,449	100
	No New Diploma	5,748	90	4,425	81
	Full-Time Workers	4,568	72	3,645	67
	Regressions	4,129	65	3,277	60
Females:	Original Sample	6,818	100	5,891	100
	No New Diploma	6,306	92	5,018	85
	Full-Time Workers	4,676	69	3,734	63
	Regressions	4,211	62	3,310	56
BACHELOR'S					
Males:	Original Sample	5,576	100	4,778	100
	No New Diploma	4,924	88	3,917	82
	Full-Time Workers	3,777	68	3,340	70
	Regressions	3,378	61	2,987	63
Females:	Original Sample	6,269	100	5,408	100
	No New Diploma	5,464	87	4,353	80
	Full-Time Workers	3,823	61	3,217	59
	Regressions	3,482	56	2,865	53
MASTER'S					
Males:	Original Sample	3,111	100	2,645	100
	No New Diploma	2,976	96	2,419	91
	Full-Time Workers	2,229	72	2,069	78
	Regressions	1,925	62	1,767	67
Females:	Original Sample	2,517	100	2,170	100
	No New Diploma	2,399	95	1,963	90
	Full-Time Workers	1,709	68	1,469	68
	Regressions	1,488	59	1,264	58
DOCTORATE					
Males:	Original Sample	707	100	595	100
	No New Diploma	700	99	576	97
	Full-Time Workers	607	86	549	92
	Regressions	557	79	495	83
Females:	Original Sample	375	100	319	100
	No New Diploma	363	97	297	93
	Full-Time Workers	286	76	250	78
	Regressions	263	70	216	68

Continued...

Appendix A (Cont.)

1990 Cohort

		2 Years (1992)		5 Years (1995)	
		#	% of Original	#	% of Original
COLLEGE					
Males:	Original Sample	4,049	100	3,449	100
	No New Diploma	3,645	90	2,575	75
	Full-Time Workers	2,972	73	2,253	65
	Regressions	2,506	62	1,928	56
Females:	Original Sample	4,794	100	4,199	100
	No New Diploma	4,401	92	3,328	79
	Full-Time Workers	3,240	68	2,437	58
	Regressions	2,642	55	2,027	48
BACHELOR'S					
Males:	Original Sample	4,998	100	4,147	100
	No New Diploma	4,278	86	2,771	67
	Full-Time Workers	3,326	67	2,438	59
	Regressions	2,883	58	2,117	51
Females:	Original Sample	6,057	100	5,241	100
	No New Diploma	5,147	85	3,546	68
	Full-Time Workers	3,689	61	2,693	51
	Regressions	3,128	52	2,234	43
MASTER'S					
Males:	Original Sample	3,392	100	2,792	100
	No New Diploma	3,212	95	2,312	83
	Full-Time Workers	2,433	72	1,932	69
	Regressions	2,091	62	1,669	60
Females:	Original Sample	3,102	100	2,666	100
	No New Diploma	2,961	95	2,285	86
	Full-Time Workers	2,167	70	1,708	64
	Regressions	1,897	61	1,491	56
DOCTORATE					
Males:	Original Sample	1,060	100	845	100
	No New Diploma	1,032	97	787	93
	Full-Time Workers	926	87	721	85
	Regressions	812	77	637	75
Females:	Original Sample	582	100	496	100
	No New Diploma	557	96	449	91
	Full-Time Workers	466	80	359	72
	Regressions	411	71	324	65

Appendix B

The Variables Used in the Regression Models

B.1 Education Characteristics

Field of study:	
Classifications for college graduates	*Classifications for university graduates*
No Specialisation	No Specialisation
Arts and Humanities	Elementary/Secondary Teaching
Nursing	Other Education
Medical Technology	Fine Arts and Humanities
Other Health	Commerce
Electrical and Electronics Technology	Economics
Mathematics and Computer Sciences	Law
General Engineering Technology	Social Sciences (Excluding the above)
Other Engineering Technology	Agricultural and Biological Sciences
Natural and Animal Sciences	Veterinary Sciences
Primary Industries	Engineering
Protection and Correction Services	Medical Professions (*i.e.*, Doctors, Dentists, Pharmacists, *etc.*)
Social Services, Recreation and Sports	Other Health (nurses and other health professionals)
Other Social Sciences	Computer Sciences
Secretarial Services	Mathematics and Physical Sciences
Other Business and Commerce	
Definition for those with a previously obtained higher degree:	
College Graduates	Defined as already having a Bachelor's level degree or higher
Bachelor's Graduates	Defined as already having a Master's degree or higher
Master's Graduates	Defined as already having a Ph.D.

B.2 Work Experience

Pre-program work experience:

This variable, representing all full-time experience before the completion of the program, but largely consisting of pre-program experience (for obvious reasons), is the only one which is not defined in a perfectly consistent fashion across all three cohorts: for the 1982 and 1986 cohorts,

summer jobs while still in school are explicitly excluded and the amount of experience is given in ranges of years in the raw data; for the 1990 cohort, there was no explicit exclusion of summer jobs and the variable is given in actual number of months. The single "at least five years of experience" variable described in the text was then found to capture the relevant effects in a compact fashion.

Post-graduation work experience:

Post graduation work experience is proxied with variables indicating part-time and full-time employment status as of various points in time since the graduation year (ascertained retrospectively as of the two interview dates). For the first interview regressions, categorical (dummy) variables representing full- or part time employment as of October in the year following graduation (1983, 1987, and 1991 for the three cohorts respectively), and June of the year after that (1984, 1988, 1992) were included: four categorical variables in all, with not working comprising the omitted baseline category for each point in time. For the second interview regressions, variables representing part-time or full-time employment as of the first interview were added as well.

B.3 Age

As defined in the text: two dummy variables representing individuals i) two to seven, or ii) more than seven years older than the cross-cohort mean for that education group.

B.4 Job Characteristics

Temporary job status:

As defined in the text.

Self-employed:

As defined in the text.

Sector of employment:

The following industrial classification was employed:[26]

Primary

Manufacturing–High Technological Capacity

[26] This classification was developed for, and is fully documented (including specific SIC codes) in Lavoie and Finnie [1999].

Manufacturing–Medium Technological Capacity

Construction, Communications, Utilities

Wholesale Trade

Retail Trade

"FIRE": Finance, Insurance, Real Estate

Business Services

Health Services

Personal Services

No Industry

B.5 Marital Status/Number of Children

As defined in text

B.6 Province/Language

As defined in the text.

Appendix C

Earnings Patterns

	1982 Cohort			1986 Cohort			1990 Cohort		
	2 Years (1984) $	5 Years (1987) $	Change (84-87) %	2 Years (1988) $	5 Years (1991) $	Change (88-91) %	2 Years (1992) $	5 Years (1995) $	Change (92-95) %
COLLEGE:									
Male	29,000	36,100	24	28,300	34,400	22	28,800	34,500	20
Female	24,000	27,100	13	23,800	26,800	13	25,600	28,100	10
Female Ratio (%)	83	75		84	78		89	81	
BACHELOR'S:									
Male	36,300	46,300	28	36,600	43,800	20	34,300	43,000	25
Female	31,000	36,400	17	31,800	36,400	14	31,700	36,200	14
Female Ratio (%)	85	79		87	83		92	84	
MASTER'S:									
Male	50,200	55,900	11	48,600	53,500	10	48,100	54,500	13
Female	42,300	45,600	8	43,000	44,400	3	42,900	47,000	10
Female Ratio (%)	84	82		88	83		89	86	
DOCTORATE:									
Male	49,000	55,800	14	48,000	53,900	12	48,600	55,000	13
Female	45,600	48,700	7	45,500	50,100	10	47,900	52,500	10
Female Ratio (%)	93	87		95	93		99	95	

Note: Samples exclude graduates who had completed another diploma by the relevant interview and include part-time workers

Appendix D

Decomposition Results
(Including part-time workers)

College

1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	1,380	5.2	0	0.0	**1,380**	**5.2**	3,950	10.8	0	0.0	**3,950**	**10.8**
Ed. Chars.	3,130	11.7	10	0.0	**3,140**	**11.8**	1,060	2.9	-30	-0.1	**1,030**	**2.8**
Work Exp.	-4,910	-18.4	50	0.2	**-4,860**	**-18.2**	-5,330	-14.5	-820	-2.2	**-6,150**	**-16.8**
Job Chars.	1,780	6.7	-250	-0.9	**1,530**	**5.7**	290	0.8	-670	-1.8	**-380**	**-1.0**
Marr./Chil.	270	1.0	-20	-0.1	**250**	**0.9**	880	2.4	-100	-0.3	**780**	**2.1**
Province	-1,590	-6.0	-100	-0.4	**-1,690**	**-6.3**	-140	-0.4	-410	-1.1	**-550**	**-1.5**
Total	60	0.2	-310	-1.2	**-250**	**-0.9**	700	1.9	-2,030	-5.5	**-1,330**	**-3.6**
Females:												
Intercept	-770	-3.1	0	0.0	**-770**	**-3.1**	6,240	22.1	0	0.0	**6,240**	**22.1**
Ed. Chars.	1,240	5.0	-260	-1.0	**980**	**3.9**	570	2.0	-230	-0.8	**340**	**1.2**
Work Exp.	-780	-3.1	80	0.3	**-700**	**-2.8**	-4,040	-14.3	-450	-1.6	**-4,490**	**-15.9**
Job Chars.	3,690	14.8	-310	-1.2	**3,380**	**13.6**	450	1.6	-90	-0.3	**360**	**1.3**
Marr./Chil.	-290	-1.2	0	0.0	**-290**	**-1.2**	-490	-1.7	10	0.0	**-480**	**-1.7**
Province	-2,410	-9.7	20	0.1	**-2,390**	**-9.6**	-1,490	-5.3	-120	-0.4	**-1,610**	**-5.7**
Total	680	2.7	-470	-1.9	**210**	**0.8**	1,240	4.4	-880	-3.1	**360**	**1.3**

1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	3,150	11.8	0	0.0	**3,150**	**11.8**	6,090	16.6	0	0.0	**6,090**	**16.6**
Ed. Chars.	20	0.1	510	1.9	**530**	**2.0**	-620	-1.7	610	1.7	**-10**	**0.0**
Work Exp.	-2,240	-8.4	890	3.3	**-1,350**	**-5.1**	-4,170	-11.4	450	1.2	**-3,720**	**-10.1**
Job Chars.	-910	-3.4	-240	-0.9	**-1,150**	**-4.3**	-3,470	-9.5	-720	-2.0	**-4,190**	**-11.4**
Marr./Chil.	550	2.1	90	0.3	**640**	**2.4**	430	1.2	-80	-0.2	**350**	**1.0**
Province	-2,030	-7.6	110	0.4	**-1,920**	**-7.2**	260	0.7	-40	-0.1	**220**	**0.6**
Total	-1,450	-5.4	1,370	5.1	**-80**	**-0.3**	-1,480	-4.0	230	0.6	**-1,250**	**-3.4**
Females:												
Intercept	4,980	20.0	0	0.0	**4,980**	**20.0**	1,810	6.4	0	0.0	**1,810**	**6.4**
Ed. Chars.	-770	-3.1	160	0.6	**-610**	**-2.5**	-920	-3.3	80	0.3	**-840**	**-3.0**
Work Exp.	-2,090	-8.4	660	2.7	**-1,430**	**-5.7**	1,830	6.5	550	1.9	**2,380**	**8.4**
Job Chars.	1,930	7.8	-60	-0.2	**1,870**	**7.5**	-1,170	-4.1	180	0.6	**-990**	**-3.5**
Marr./Chil.	220	0.9	20	0.1	**240**	**1.0**	220	0.8	-130	-0.5	**90**	**0.3**
Province	-2,710	-10.9	130	0.5	**-2,580**	**-10.4**	-1,090	-3.9	-50	-0.2	**-1,140**	**-4.0**
Total	1,560	6.3	910	3.7	**2,470**	**9.9**	680	2.4	630	2.2	**1,310**	**4.6**

Appendix D (Cont.)

Bachelor's

1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	5,780	15.5	0	0.0	**5,780**	**15.5**	5,510	11.7	0	0.0	**5,510**	**11.7**
Ed. Chars.	560	1.5	200	0.5	**760**	**2.0**	3,180	6.8	-150	-0.3	**3,030**	**6.4**
Work Exp.	-4,140	-11.1	1,030	2.8	**-3,110**	**-8.3**	-6,930	-14.7	-100	-0.2	**-7,030**	**-14.9**
Job Chars.	-1,390	-3.7	100	0.3	**-1,290**	**-3.5**	-2,570	-5.5	-270	-0.6	**-2,840**	**-6.0**
Marr./Chil.	-140	-0.4	40	0.1	**-100**	**-0.3**	1,120	2.4	-100	-0.2	**1,020**	**2.2**
Province	-1,370	-3.7	-90	-0.2	**-1,460**	**-3.9**	-1,700	-3.6	-210	-0.4	**-1,910**	**-4.1**
Total	-710	-1.9	1,280	3.4	**570**	**1.5**	-1,390	-3.0	-830	-1.8	**-2,220**	**-4.7**
Females:												
Intercept	160	0.5	0	0.0	**160**	**0.5**	4,000	10.5	0	0.0	**4,000**	**10.5**
Ed. Chars.	1,500	4.6	310	0.9	**1,810**	**5.5**	390	1.0	360	0.9	**750**	**2.0**
Work Exp.	-2,300	-7.0	780	2.4	**-1,520**	**-4.6**	-4,190	-10.9	300	0.8	**-3,890**	**-10.2**
Job Chars.	510	1.6	30	0.1	**540**	**1.6**	770	2.0	-200	-0.5	**570**	**1.5**
Marr./Chil.	950	2.9	-60	-0.2	**890**	**2.7**	600	1.6	10	0.0	**610**	**1.6**
Province	-1,080	-3.3	30	0.1	**-1,050**	**-3.2**	-1,360	-3.6	-70	-0.2	**-1,430**	**-3.7**
Total	-260	-0.8	1,080	3.3	**820**	**2.5**	210	0.5	390	1.0	**600**	**1.6**

1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	2,360	6.3	0	0.0	**2,360**	**6.3**	2,460	5.2	0	0.0	**2,460**	**5.2**
Ed. Chars.	1,650	4.4	-20	-0.1	**1,630**	**4.4**	2,220	4.7	-370	-0.8	**1,850**	**3.9**
Work Exp.	-3,790	-10.1	860	2.3	**-2,930**	**-7.8**	-4,400	-9.3	710	1.5	**-3,690**	**-7.8**
Job Chars.	-5,430	-14.5	6,900	18.5	**1,470**	**3.9**	-3,130	-6.6	30	0.1	**-3,100**	**-6.6**
Marr./Chil.	140	0.4	-50	-0.1	**90**	**0.2**	10	0.0	-150	-0.3	**-140**	**-0.3**
Province	-1,700	-4.5	0	0.0	**-1,700**	**-4.5**	-810	-1.7	210	0.4	**-600**	**-1.3**
Total	-6,770	-18.1	7,690	20.6	**920**	**2.5**	-3,660	-7.8	430	0.9	**-3,230**	**-6.9**
Females:												
Intercept	1,550	4.7	0	0.0	**1,550**	**4.7**	-1,100	-2.9	0	0.0	**-1,100**	**-2.9**
Ed. Chars.	770	2.3	40	0.1	**810**	**2.5**	1,150	3.0	180	0.5	**1,330**	**3.5**
Work Exp.	-290	-0.9	370	1.1	**80**	**0.2**	-120	-0.3	240	0.6	**120**	**0.3**
Job Chars.	-400	-1.2	10	0.0	**-390**	**-1.2**	260	0.7	-420	-1.1	**-160**	**-0.4**
Marr./Chil.	1,000	3.0	-30	-0.1	**970**	**3.0**	1,070	2.8	-50	-0.1	**1,020**	**2.7**
Province	-1,910	-5.8	10	0.0	**-1,900**	**-5.8**	-1,020	-2.7	40	0.1	**-980**	**-2.6**
Total	720	2.2	410	1.2	**1,130**	**3.4**	240	0.6	-10	0.0	**230**	**0.6**

Appendix D (Cont.)

Master's

1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	250	0.5	0	0.0	**250**	**0.5**	5,570	9.7	0	0.0	**5,570**	**9.7**
Ed. Chars.	3,490	6.8	270	0.5	**3,760**	**7.3**	2,850	5.0	670	1.2	**3,520**	**6.1**
Work Exp.	-6,340	-12.3	-580	-1.1	**-6,920**	**-13.5**	-6,030	-10.5	-1,330	-2.3	**-7,360**	**-12.8**
Job Chars.	1,330	2.6	-50	-0.1	**1,280**	**2.5**	-1,120	-1.9	530	0.9	**-590**	**-1.0**
Marr./Chil.	1,740	3.4	-230	-0.4	**1,510**	**2.9**	-1,790	-3.1	-340	-0.6	**-2,130**	**-3.7**
Province	-550	-1.1	-20	0.0	**-570**	**-1.1**	-380	-0.7	-140	-0.2	**-520**	**-0.9**
Total	-90	-0.2	-620	-1.2	**-710**	**-1.4**	-900	-1.6	-600	-1.0	**-1,500**	**-2.6**
Females:												
Intercept	-2,280	-5.1	0	0.0	**-2,280**	**-5.1**	8,500	17.4	0	0.0	**8,500**	**17.4**
Ed. Chars.	-3,510	-7.9	120	0.3	**-3,390**	**-7.6**	40	0.1	400	0.8	**440**	**0.9**
Work Exp.	2,880	6.5	470	1.1	**3,350**	**7.5**	-5,840	-11.9	-40	-0.1	**-5,880**	**-12.0**
Job Chars.	3,000	6.7	-100	-0.2	**2,900**	**6.5**	590	1.2	3,320	6.8	**3,910**	**8.0**
Marr./Chil.	950	2.1	10	0.0	**960**	**2.2**	-1,660	-3.4	70	0.1	**-1,590**	**-3.3**
Province	-1,010	-2.3	90	0.2	**-920**	**-2.1**	-1,410	-2.9	-20	0.0	**-1,430**	**-2.9**
Total	30	0.1	590	1.3	**620**	**1.4**	210	0.4	3,740	7.6	**3,950**	**8.1**

1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	3,280	6.4	0	0.0	**3,280**	**6.4**	1,570	2.7	0	0.0	**1,570**	**2.7**
Ed. Chars.	2,950	5.7	-320	-0.6	**2,630**	**5.1**	1,470	2.6	-500	-0.9	**970**	**1.7**
Work Exp.	-5,410	-10.5	-170	-0.3	**-5,580**	**-10.8**	-1,880	-3.3	-150	-0.3	**-2,030**	**-3.5**
Job Chars.	-210	-0.4	-310	-0.6	**-520**	**-1.0**	-280	-0.5	410	0.7	**130**	**0.2**
Marr./Chil.	1,380	2.7	-150	-0.3	**1,230**	**2.4**	-830	-1.4	-120	-0.2	**-950**	**-1.7**
Province	-2,260	-4.4	70	0.1	**-2,190**	**-4.3**	-530	-0.9	-70	-0.1	**-600**	**-1.0**
Total	-280	-0.5	-890	-1.7	**-1,170**	**-2.3**	-480	-0.8	-440	-0.8	**-920**	**-1.6**
Females:												
Intercept	-4,340	-9.7	0	0.0	**-4,340**	**-9.7**	4,770	9.8	0	0.0	**4,770**	**9.8**
Ed. Chars.	-1,000	-2.2	-90	-0.2	**-1,090**	**-2.4**	260	0.5	270	0.6	**530**	**1.1**
Work Exp.	8,120	18.2	620	1.4	**8,740**	**19.6**	-2,880	-5.9	650	1.3	**-2,230**	**-4.6**
Job Chars.	-120	-0.3	110	0.2	**-10**	**0.0**	520	1.1	170	0.3	**690**	**1.4**
Marr./Chil.	630	1.4	30	0.1	**660**	**1.5**	-90	-0.2	60	0.1	**-30**	**-0.1**
Province	-2,420	-5.4	-60	-0.1	**-2,480**	**-5.6**	-2,020	-4.1	-130	-0.3	**-2,150**	**-4.4**
Total	870	1.9	600	1.3	**1,470**	**3.3**	560	1.1	1,020	2.1	**1,580**	**3.2**

Appendix D (Cont.)

Doctorate

1982 vs 1986

	2 years (1984-1988)						5 years (1987-1991)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	-8,110	-16.2	0	0.0	**-8,110**	**-16.2**	-5,170	-9.2	0	0.0	**-5,170**	**-9.2**
Ed. Chars.	660	1.3	-1,790	-3.6	**-1,130**	**-2.3**	-320	-0.6	-870	-1.5	**-1,190**	**-2.1**
Work Exp.	4,450	8.9	-50	-0.1	**4,400**	**8.8**	4,220	7.5	510	0.9	**4,730**	**8.4**
Job Chars.	3,600	7.2	150	0.3	**3,750**	**7.5**	3,700	6.6	-1,250	-2.2	**2,450**	**4.3**
Marr./Chil.	-190	-0.4	-240	-0.5	**-430**	**-0.9**	-3,600	-6.4	-160	-0.3	**-3,760**	**-6.7**
Province	20	0.0	-110	-0.2	**-90**	**-0.2**	560	1.0	130	0.2	**690**	**1.2**
Total	420	0.8	-2,030	-4.1	**-1,610**	**-3.2**	-610	-1.1	-1,650	-2.9	**-2,260**	**-4.0**
Females:												
Intercept	-5,140	-10.9	0	0.0	**-5,140**	**-10.9**	-320	-0.6	0	0.0	**-320**	**-0.6**
Ed. Chars.	-1,430	-3.0	-1,160	-2.5	**-2,590**	**-5.5**	-2,550	-5.0	-1,240	-2.4	**-3,790**	**-7.4**
Work Exp.	1,870	4.0	-1,060	-2.2	**810**	**1.7**	7,970	15.6	-1,020	-2.0	**6,950**	**13.6**
Job Chars.	4,160	8.8	700	1.5	**4,860**	**10.3**	-880	-1.7	270	0.5	**-610**	**-1.2**
Marr./Chil.	890	1.9	-330	-0.7	**560**	**1.2**	-1,430	-2.8	150	0.3	**-1,280**	**-2.5**
Province	1,510	3.2	100	0.2	**1,610**	**3.4**	40	0.1	-310	-0.6	**-270**	**-0.5**
Total	1,860	3.9	-1,750	-3.7	**110**	**0.2**	2,830	5.6	-2,150	-4.2	**680**	**1.3**

1982 vs 1990

	2 years (1984-1992)						5 years (1987-1995)					
	Beta		X		Total		Beta		X		Total	
	$	%	$	%	$	%	$	%	$	%	$	%
Males:												
Intercept	-7,120	-14.2	0	0.0	**-7,120**	**-14.2**	-530	-0.9	0	0.0	**-530**	**-0.9**
Ed. Chars.	3,400	6.8	-60	-0.1	**3,340**	**6.7**	1,200	2.1	330	0.6	**1,530**	**2.7**
Work Exp.	3,460	6.9	270	0.5	**3,730**	**7.5**	-3,390	-6.0	1,800	3.2	**-1,590**	**-2.8**
Job Chars.	2,930	5.9	840	1.7	**3,770**	**7.5**	1,870	3.3	50	0.1	**1,920**	**3.4**
Marr./Chil.	-300	-0.6	-290	-0.6	**-590**	**-1.2**	-1,970	-3.5	110	0.2	**-1,860**	**-3.3**
Province	-2,910	-5.8	-70	-0.1	**-2,980**	**-6.0**	750	1.3	-130	-0.2	**620**	**1.1**
Total	-550	-1.1	690	1.4	**140**	**0.3**	-2,070	-3.7	2,150	3.8	**80**	**0.1**
Females:												
Intercept	-19,920	-42.2	0	0.0	**-19,920**	**-42.2**	7,300	14.3	0	0.0	**7,300**	**14.3**
Ed. Chars.	1,470	3.1	-610	-1.3	**860**	**1.8**	-140	-0.3	310	0.6	**170**	**0.3**
Work Exp.	12,660	26.8	-40	-0.1	**12,620**	**26.8**	1,770	3.5	290	0.6	**2,060**	**4.0**
Job Chars.	5,670	12.0	490	1.0	**6,160**	**13.1**	150	0.3	670	1.3	**820**	**1.6**
Marr./Chil.	2,400	5.1	-170	-0.4	**2,230**	**4.7**	-4,910	-9.6	-350	-0.7	**-5,260**	**-10.3**
Province	30	0.1	-20	0.0	**10**	**0.0**	-2,660	-5.2	60	0.1	**-2,600**	**-5.1**
Total	2,310	4.9	-350	-0.7	**1,960**	**4.2**	1,510	3.0	980	1.9	**2,490**	**4.9**

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